

Assessing Competition
in the
Domestic Water Heating and Cooking Fuel Market

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I. INTRODUCTION

- 1.1 Water heating and cooking fuel is essential in the daily life of consumers in Hong Kong. Consequently, the impact of market practice and competition on consumer welfare is of interest to the Consumer Council. This study examines the competition environment and assesses its impact on consumer interest.
- 1.2 This study was carried out by Council staff under the guidance of the Consumer Council's Committee on Competition Studies comprising:-

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The Council wishes to acknowledge the following organizations for their assistance in this study:-

China Light & Power Co., Ltd.

Caltex Oil Hong Kong Ltd.

Economics Services Branch
Esso Hong Kong Ltd.
The Gas Standards Office
The Hong Kong and China Gas Co., Ltd.
Hongkong Electricity Co.
The Hong Kong Housing Authority
The Hong Kong Housing Society
Mobil Oil Hong Kong Ltd.
New World Development Ltd.
Shell Hong Kong Ltd.
Sun Hung Kai Properties Ltd.

OBJECTIVE OF STUDY

- 1.4 The objective of this study is to examine the market competitiveness and trade practices of companies in the domestic water heating and cooking fuel supply industry focusing its impact on consumer interest. It examines the market environment by looking at the existing legal and regulatory framework within which the market operates, market structure and degree of concentration, market behaviour and market performance. Based on the findings, the Council puts forward a number of recommendations for improving market competition.
- 1.5 Hong Kong and China Gas Co. Ltd. (HKCG) is a key supplier of water heating and cooking fuel in the market. It is not a franchised utility, like the four public bus companies, nor is it under a Scheme of Control, like the two electricity utilities. As the company's core business is almost exclusively in this market, considerable attention should be devoted to the company and its products for analysis. It is not the intention of this report to conduct an exclusive investigation of the behaviour of HKCG in the market place.

ANALYTICAL FRAMEWORK

- 1.6 This report incorporates the classic Structure-Behaviour-Performance framework in industrial economic studies. This framework is consistent with the guideline used by the Monopolies and Mergers

Commission (MMC) in U.K. in assessing competition¹. The guidelines aim at analysing:

- a) past levels of profitability in the industry;*
- b) history of price movements, both relative to costs and between firms in the industry;*
- c) changes in concentration;*
- d) changes in the market shares of the firms in the industry;*
- e) changes in import penetration;*
- f) successful or failed attempts at entry into the market place; and*
- g) the history of firms leaving the market.*

- 1.7 Chapter II examines MARKET STRUCTURE by defining the market. The legal, technical and cultural issues relating to market structure are also studied.
- 1.8 Chapter III assesses MARKET COMPETITION by examining market shares and market concentration (MMC guidelines d and c).
- 1.9 Chapter IV examines how POTENTIAL COMPETITION from substitutes and new entrants may influence the competitive environment in the market place (MMC guidelines f and g).
- 1.10 MARKET BEHAVIOUR in the form of pricing is examined in Chapter V (MMC guideline b). Market behaviour such as competitive practices, customer services and safety are studied and analysed in Chapter V.
- 1.11 MARKET PERFORMANCE in the forms of company growth and profitability (MMC guideline a) is examined in Chapter VI.
- 1.12 Chapter VII examines PROMOTION OF MARKET COMPETITION and looks at competition between energy suppliers and alternatives not yet available to the consumer.
- 1.13 Chapter VIII explores REGULATORY OPTIONS and suggests a number of measures which the Government might consider implementing.
- 1.14 Chapter IX submits the need of A CO-ORDINATED ENERGY POLICY FOR HONG KONG and proposes a framework for effective management of energy suppliers.

¹ *Assessing Competition, Monopolies and Mergers Commission, 1993.*

1.15 Finally, Chapter X presents **CONCLUSIONS AND RECOMMENDATIONS**, examining the means by which the Government might establish a structure to better serve community interest and pave the way for promotion of fair competition.

II. MARKET STRUCTURE

DEFINITION OF THE MARKET

- 2.1 Domestic consumers of water heating and cooking fuel in Hong Kong are currently served by Towngas, liquefied petroleum gas (LPG) in piped or cylinder form, electricity and to a lesser extent, kerosene.

Towngas

- 2.2 Towngas is supplied by the Hong Kong & China Gas Co., Ltd. It is a processed gas manufactured from naphtha. This manufactured gas is delivered to consumers throughout the territory via pipelines laid underground.

Liquefied Petroleum Gas (Piped and Cylinder LPGs)

- 2.3 Liquefied Petroleum Gas (LPG) customers are served by six private companies. The four major companies are Caltex Oil Hong Kong Ltd., Esso Hong Kong Ltd., Mobil Oil Hong Kong Ltd. and Shell Hong Kong Ltd. LPG supplies are delivered in two forms, cylinders and pipelines. The majority of LPG customers are currently using LPG contained in cylinders². Piped LPG provides a more convenient mode of delivery to consumers, but is only available to some housing complexes built in the last two decades

Electricity

- 2.4 Electricity supply in the territory is primarily from China Light & Power Co., Ltd. in Kowloon and New Territories and Hong Kong Electric Co., Ltd. in Hong Kong island. Households use electricity as the main source of energy for lighting and other electrical appliances. The use of electricity for domestic cooking is not widely practiced. The most commonly used electrical appliances are rice cookers, microwave ovens and electric kettles. However, electricity companies have

² LPG cylinders is in the process of being phased out.

increased their efforts to promote the concept of "electric kitchens" to consumers by introducing them to electric cooking.

Kerosene

- 2.5 Kerosene is considered as an outdated, inconvenient and unenvironmentally friendly energy source. It is not widely used and is being phased out. Thus, this paper will not include kerosene in its analysis.

FACTORS AFFECTING MARKET STRUCTURE

- 2.6 In Hong Kong, the choice of fuel supply in most cases is exercised at two levels. **The developer** determines the type of energy available to each flat. This is influenced by technical, legal and cultural factors. **The consumer** is concerned with the type of energy available and make their choice according to the price-quality tradeoff.

Technical And Legal Factors

- 2.7 A key factor affecting the competitiveness of the gas market for water heating and cooking relates to the relative density of two gaseous fuel, Towngas and LPG. Towngas has a low density of 0.55Kg/m^3 and is lighter than air, whereas LPG has a density of 2.2Kg/m^3 , and is heavier than air.
- 2.8 The relative density of the two forms of gas contributes to significantly different safety concerns in case of leakage. Towngas, being a lighter fuel, is likely to be dissipated into the atmosphere with no accumulation in case of leakage.
- 2.9 With a density higher than air, a LPG leakage is likely to result in accumulation until discovery. In addition to complications in the clean up process, the main hazard of such accumulation is the possibility of eventual ignition and explosion.
- 2.10 The Government has always held the view that the relatively lower density of Towngas makes it a "safer" gas in the case of leakage. In 1990, the Gas Standards Office enacted the Gas Safety Ordinance.

Section 17(4) of the Gas Safety (Gas Supply) Regulations provides that:-

“No person shall install a gas main for the conveyance of liquefied petroleum gas along or across a road.”

Implication to Developers' Choice of Gaseous Fuel

2.11 This, in effect, banned the underground transmission of LPG under public roadways in Hong Kong. The access to piped LPG supply to developers is affected with two exceptions:-

- a) *LPG/Air, a form of LPG, was supplied to the town of Tuen Mun by HKCG on a large scale prior conversion to Towngas in 1994. The supply is transported under public roadways. According to the Gas Standards Office, LPG/Air is a simulated natural gas and is used as a stop-gap measure since Towngas is not currently available in the area. The use of LPG/Air can be justified as its density is close to that of air and it is perceived to be safer than LPG. The Government expects HKCG to convert the supply from LPG/Air to Towngas once the supply becomes available in the area.*
- b) *LPG is transported across roadways within the confined areas of a number of large housing complex such as Mei Foo Sun Chuen and South Horizon. For such developments to obtain piped LPG, a storage depot must be built in the vicinity of the development. LPG is then supplied to domestic households via pipelines within the development.*

2.12 The Gas Standard Office stipulates additional safety requirements concerning the building of the storage depot in a housing complex. It specifies that no residential structure should be built on top of, or within a defined distance from, the storage depot. Hence, land must be earmarked for the storage depot within the development.

2.13 To compensate developers for the loss of building space, LPG suppliers must pay a premium to developers for the right to supply fuel to residences in the developments. In Hong Kong, where land commands high premium, the LPG option poses significant economic cost. This is especially the case for urban developments.

2.14 Private developers also suggest that choosing LPG means inconveniences from additional paperwork for on-site “dangerous goods storage” applications to the Gas Standards Office, the Fire Services Department and related Government agencies. Such

applications would take 2 to 3 months to process. Application is not required for Towngas since it is not considered as a dangerous goods, although Towngas is also subjected to stringent safety regulations.

The Housing Authority, its Policy and Implication on Competition

2.15 Based on grounds of "safety, continuity of supply, land space and planning requirements, and costs", the Housing Authority (HA), the biggest developer and landlord in Hong Kong, has adopted the following policy in 1987³:-

- a) Where Towngas or LPG/Air supply is available, either one of them should be used.*
- b) Where Towngas or LPG/Air is unavailable but the Hong Kong & China Gas Co. Ltd. gives an assurance to provide Towngas or LPG/Air supply to coincide with the completion dates of the estate/courts, one or other of these two, as will become available, should be used.*
- c) Bulk LPG piped supply will only be considered where Towngas or LPG/Air supply is not at present available and will not become available by the date of completion of the estate/court, e.g. estates on the outlying islands.*

2.16 The HA policy is contested by the LPG suppliers as favouring the use of Towngas and denying LPG access to HA's developments. This is especially the case, as suggested by a LPG supplier, when LPG suppliers are required to pay a premium to HA for the land to build the storage depot while HKCG is not required to pay for the land which pipework is laid. The implication of this to competition is significant since HA represents the largest developer in Hong Kong, responsible for more than 50% of new developments.

2.17 In 1993, the HA agreed to undertake pilot projects allowing LPG and Towngas to compete for the supply and distribution of piped gas in public housing. After a feasibility study on the supply of LPG to Tin Wan Estate, HA concluded that due to various technical and commercial constraints the piping of LPG was not viable. Identifying a suitable location for the LPG storage compound was cited as the prime difficulty in attempting to satisfy the current Gas Safety Ordinance requirements. Under the circumstances, HA's internal directive established in 1987 remains as a policy in that LPG piped

³ Housing Authority's letter to Mr. Steve Harman, Chairman, LPG Safety & Technical Committee dated 22nd May 1989.

gas is only allowed to be used where Towngas or LPG/Air is not available.

- 2.18 The above clearly demonstrated the developers' choice in their decision of gaseous fuel in the energy mix provided to consumers gives a competitive advantage to Towngas over LPG. This advantage is likely to continue without significant regulatory changes or technical improvements anticipated in the near future to enhance the safety feature of LPG supply.

Consumers' Influence in the Energy Decision

- 2.19 It has been suggested that a consumer's choice of gaseous fuel can be exercised through market forces. If the choice of gas is a significant component in a consumer's housing decision, that preference will be revealed in the housing market. In this case, the consumer can exert influence by demonstrating a preference towards a certain energy source. For example, consumers may refuse to purchase flats in a development which does not supply their preferred energy source. The results of such consumer influence is ultimately reflected through property prices.

- 2.20 It is important to point out that the above argument is valid only if:-

- a) consumers are fully aware of the different energy options available and understand the implications of each energy choice, and*
- b) a competitive housing market exists for the buyer whereby developers would take into account of the buyers' preference for a certain energy source.*

However, the property market in Hong Kong has tended to be a seller's market. For fifteen years between 1981 to 1995, Hong Kong only saw two short periods of buyers' market totaling three and a quarter years⁴. The ability of the consumer in influencing the facilities provided in properties has thus been weak. In this case, property prices may not completely reveal the consumer's preference.

⁴ Since the 1980, there was a general upward trend for housing prices, except for market downturns in the quarters(Q) during 1981Q3 - 1983Q4, 1987Q3 - 1987Q4, 1989Q2 - 1989Q3, 1992Q3 - 1992Q4, and 1994Q3 - 1995Q2. Other than the first and the last periods, downturns are typically short, buyers' preferences is not likely to be reflected and sustained in these short periods.

Consumers' Choice after Occupancy of Properties

- 2.21 The switching of a central gas supply from Towngas to LPG or vice versa beyond the development construction stage is not practical since it requires a complete overhaul of transmission piping for the whole structure. This is in addition to replacement costs for equipment. It is unlikely that any individual, or group of consumers, will be willing to undertake the required effort to switch to an alternate fuel supply. Towngas and piped LPG, therefore, cannot be considered as substitute for one another from the consumer's perspective.
- 2.22 While cylinder LPG provides a feasible alternative to centralized gas, cylinder gas does not represent a practical choice as it is bulky and inconvenient.

Technical And Cultural Factors

- 2.23 The use of electricity is a possible alternative to gas in the water heating and cooking energy market. Two types of electric water heaters are used in Hong Kong: storage water heaters and instantaneous water heaters. The majority of the electric water heaters installed are of the storage type. The amount of heated water from this type of heater is limited by the water storage capacity. This compares unfavourably to the gas water heaters which provide a continuous supply of heated water.
- 2.24 A more comparable alternative to the gas water heater is the instantaneous type of water heater. However, instantaneous water heaters can only be installed where the electricity supply is boosted with a three-phase electrical installation. It is important to note that three-phase installation is not available in most small to medium size apartments in Hong Kong. Hence, the majority of the electric water heaters installed in residential households to date are of the water storage type.
- 2.25 The use of electricity for cooking is mostly confined to appliances such as electric kettles, rice cookers, and microwave ovens. For Chinese cuisine preparation, "flame cooking" by gas fuel is preferred by consumers. While the actual energy consumption for 'flame cooking' is estimated to be as low as 13%⁵, the importance of gas in cooking is beyond that illustrated by this statistic. "Flame cooking" is a critical ingredient in the preparation of the Chinese

⁵ Figure provided by HKCG.

meal and is crucial to the daily life of Chinese consumers. With over 90% of the Hong Kong population being ethnic Chinese, private developers would hesitate in not supplying gas supply in the kitchen for cooking purposes in their developments. This confirms the significant role of gas in the livelihood of Hong Kong's consumers.

- 2.26 In the water heating market, gas and electricity appears to be close substitutes of each other. Whether this is so is assessed in Chapter 5.

SUMMARY

- 2.27 LPG, Towngas and electricity are not perfect substitutes for one another due to their different properties, distribution network and regulatory requirements.
- 2.28 LPG companies have limited access to the residential housing market due to Government regulation. This, in turn, prevents them from competing effectively in the market place.
- 2.29 The real benefit to the consumer from competition between electricity and Towngas is not obvious. This is partly due to the cultural preference of "flame cooking" in Chinese cuisine. Furthermore, competition is seriously restrained as only one supplier exists for each energy source. Electricity supply is provided by either CLP or HKE depending on the consumer's place of residence; and for manufactured gas, HKCG is the only supplier.
- 2.30 In any case, the choice of energy mix is exercised at the pre-consumer stage by developers for new developments. For other domestic residential units, while consumers could switch energy supply in theory, their ability to choose and switch is constrained by the current legal, cultural and technical constraints. This has created a significant competitive advantage for HKCG and resulted in its market domination.

III. MARKET COMPETITION - MARKET SHARE

- 3.1 The important role of the water heating and cooking fuel to consumers in Hong Kong is established in the last chapter. Furthermore, there appears to be *prima facie* evidence of competitive advantage by HKCG in the market place due to technical, legal and cultural factors. In this chapter, we examine how such factors affect the relative market share of each type of fuel in the market.

MARKET SHARE OF GAS SUPPLIERS (TOWNGAS, PIPED LPG AND CYLINDER LPG)

- 3.2 In the total gas market (consisting of Towngas, piped and cylinder LPG) HKCG has the largest market share which stood at 66.0% in 1993. Piped LPG has the smallest share of 7.0% and cylinder LPG has 27.0% (Table 1).
- 3.3 Moreover, evidence in Table 1 indicates that both cylinder LPG and piped LPG are experiencing declining to stagnant market growth, despite a general growth in gas consumption. The cylinder LPG market has been experiencing a decline in market share since 1981. Its market share declined from 49.5% in 1981 to 27.0% in 1993. This is partly due to socio-economic changes in Hong Kong where residential developments are increasingly equipped to supply central gas to consumers. Central gas supply, in the forms of Towngas and piped LPG, is projected to continue to grow as old buildings are replaced by new developments.
- 3.4 While the piped gas market expanded as a whole, piped LPG is experiencing a decline in market share, dropping from 9.3% in 1981 to 7.0% in 1993. It is important to further point out that the LPG market share reported represents the aggregate market share by 4 companies. Table 2 displays the market share of the LPG suppliers in the LPG market.
- 3.5 In the cylinder LPG market, a relatively competitive market exists amongst the LPG suppliers, with market share fairly evenly distributed between five companies. The largest player controls 29% of the market share and the smallest player claims a 12% share. Market share in the piped LPG is less evenly distributed with the largest supplier in the market controlling almost half the market. (Table 2).
- 3.6 While the decline in market share by cylinder LPG to central gas supply should not be a cause for concern in itself, the decline in market share by piped LPG, together with the fact that HKCG is the

sole supplier of Towngas, suggests a significant market dominance by HKCG. This warrants closer examination.

- 3.7 HKCG is strong in both the private and public housing sectors, commanding a large market share in the central gas market, (piped LPG and Towngas (Table 3). Over 80% of residential households with central gas supply are piped for Towngas⁶. In 1994, the number of households piped for Towngas was approximately 1.2 million, representing a 40% increase in the number of households piped since 1988.
- 3.8 In 1992, the last year where statistics for private, Housing Authority (HA), and Housing Society (HS) sectors was available, the relative market shares of HKCG were 89.6%, 81.5% and 57.8%, respectively (Table 3). The nearly 90% statistic for private residential structure illustrates two competition issues in the gas market.
- 3.9 First, it confirms the increasing market dominance by HKCG in the gas market as stated in the last chapter. Second, the competitive advantage of HKCG over LPG suppliers is not a direct result of the policy practiced by the Housing Authority, as have been suggested by a number of LPG suppliers. Piped LPG suppliers' ability to compete is constrained by the Gas Safety (Gas Supply) Regulation which prohibits the laying of pipelines for LPG along or across roads⁷.
- 3.10 An interesting observation from the Table is the significantly lower market share of Towngas in Housing Society developments. Upon closer examination, two factors are attributed for the low market share of Towngas in this market segment. First, Housing Society developments are primarily located in areas outside the Towngas distribution network. Second, Housing Society developments also tend to be smaller in size and can be served by smaller LPG storage facilities. These smaller storage facilities not only occupy less building space, they also pose fewer problems and difficulties for complying with safety regulations.

Electricity As a Competitor

- 3.11 In terms of the total energy market, including gas as well as electricity consumption, a more complicated competition environment arises. Exact market share statistics relating to electricity for water heating and cooking are not available due to the lack of data. The only

⁶ Hong Kong and China Gas Co., Ltd., estimated that there were approximately 20% inactive accounts in 1992.

⁷ See para. 2.10.

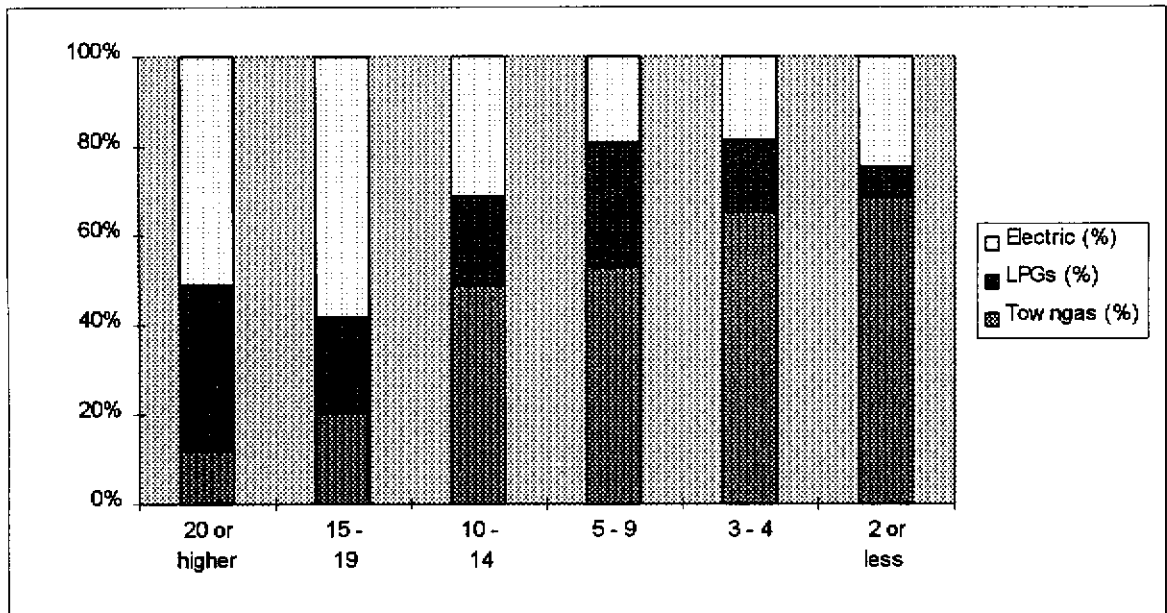
estimates of market share are obtained from private market research data provided by individual companies. Electricity usage data are provided by China Light and Power Co., Ltd. (CLP), from a survey it carried out in 1992 for its supply area. Since, the survey collated appliance ownership information from households in CLP's supply area alone, it may not provide an accurate picture of the overall market. As a result, market share estimates have also been obtained from HKCG.

- 3.12 In the total energy market, HKCG remains the largest player in the market. The estimated market share of the three energy fuels according to estimates obtained from CLP and HKCG are as follows:

	CLP estimates (%)	HKCG estimates(%)
Electricity	23.5	30.0
Towngas	51.4	40.0
LPG	25.1	30.0

- 3.13 Electricity and Towngas appear to have their own niche in the overall market (see figure 1). While electricity dominates the water heater market in premises that are fifteen years or older, Towngas is the main supplier of fuel to newer premises.
- 3.14 Approximately 50% of residential premises of 20 years and older use electric water heaters and 10% use Towngas water heaters, whilst in buildings of less than 2 years old, Towngas water heaters has obtained 70% market share, with the remainder 25% using electricity. This data also depicts a trend of continuous increase in market share and market dominance by HKCG under the current competitive environment as older buildings mainly served by cylinder LPG and storage type electricity water heaters are being replaced.

Figure 1 - Ownership of Electric and Towngas Water Heaters by Age of Premises (1992)



Source: The China Light and Power Co., Ltd.

SUMMARY

3.15 HKCG commands an increasing dominance in the market share analysis. The significant role of HKCG to the community is not only the market position which it currently enjoys, but also the increasing importance based on the observed trend, as old buildings are replaced with new buildings supplied with Towngas.

IV. MARKET COMPETITION - SUBSTITUTES AND NEW ENTRANTS

- 4.1 Although Towngas, piped LPG, and electricity appear to be alternative sources of energy, earlier discussions revealed that these energy sources may not be close substitutes for each other. Towngas supplied by HKCG appears to possess a competitive advantage over the other energy fuels as a result of technological, legal and cultural factors. This is reflected by market share statistics in the previous chapter.
- 4.2 Whether a company can lever its market dominance to exercise market power depends not only on the relative market share it possesses, but also competition from the threat of switching by consumers and potential entrants to the industry. Potential competition may provide enough pressure to the dominant player, in this case HKCG, to behave like a company in a perfectly competitive market.

THE CHOICE BETWEEN LPG AND TOWNGAS

- 4.3 While cylinder LPG can be easily purchased from authorized dealers, the supply of piped LPG and Towngas requires transmission piping. Since the two types of gas requires different equipment for transmission and distribution, and no housing development is built to support the supply of both fuels, the choice of gas supply is, in effect, decided at the construction stage of a development. If consumer's preference towards gas fuel is not clearly reviewed, the developers' choice may not coincide with that of the consumers'.
- 4.4 Chapter 2 outlined a number of important factors faced by developers and consumers in their choice of gas supply. The switching of a central gas supply from Towngas to LPG and vice versa requires a complete overhaul of transmission piping for the whole structure in addition to replacement costs for equipment.
- 4.5 Switching to an alternate fuel supply is therefore almost impossible unless groups of consumers decide to undertake extra efforts required. Towngas and piped LPG, thus, cannot be considered as substitutes from the consumer's perspective. This is particularly true in the case for residents of rental properties and for individuals.

SWITCHING BETWEEN GAS AND ELECTRICITY

- 4.6 While it is not feasible for consumers to switch from one piped gas supplier to another, they can switch from gas to electricity since electricity supply is available in all homes.
- 4.7 As the use of electricity in cooking is not widely practiced in Hong Kong due to the way Chinese food is cooked (with the exception of rice cookers), this discussion on energy switching is focused on water heating.
- 4.8 Currently, the growth of electricity usage for water heating is limited due to the fact that most existing residential structures in Hong Kong are not built to support instantaneous water heating for bathroom use as stated in Chapter 2. For these consumers, only storage-type electric water heating can be installed. This compares unfavourably to piped gas in terms of convenience since piped gas is capable of supplying users with an unlimited continuous flow of heated water⁸.
- 4.9 Consumers can switch from gas to electric water heating with the purchase of an electric water heater. The cost to consumers ranges from \$1,200 to \$2,200 for storage type water heaters. Standard installation is carried out by the vendor at a cost of a few hundred dollars.
- 4.10 Consumers not satisfied with electric water heating, on the other hand, can switch to gas water heating subject to the availability central gas in the building⁹. The cost of Towngas equipment varies from just over \$2,000 to under \$10,000 inclusive of installation cost. The cost of LPG water heaters ranges from just over \$1,000 to around \$5,000. Installation charges vary, but one dealer quoted close to \$1,000 for the work.
- 4.11 While switching from gas fuel to electricity, and vice versa, appear to offer a viable choice for consumers, the decision to switch involves a cash outlay. As a result, switching will only occur if the cash outlay and inconvenience caused is justified by the savings realized.

⁸ See figure 1 in Chapter 3.

⁹ While cylinder LPG can by-pass this, this option is not the preference of most consumers due to inconvenience caused by storage and limited capacity of cylinders.

ELASTICITY OF DEMAND FOR TOWNGAS

4.12 The implication of the constraints on the consumer's ability to switch from one energy source to another is measured by the elasticity of demand. The elasticity for Towngas has been measured (Appendix 1). The analysis suggests that the elasticity for Towngas is low, indicating that consumers' demand is not responsive to price changes. In other words, as a necessary utility, the quantity of gas consumption will not be reduced despite an increase in price, thus, reaffirming the previous conclusion that the consumer lacks the ability to switch.

BARRIERS TO ENTRY

4.13 According to the Contestable Market Theory in industrial economics, the existence of opportunities for excess returns by attaining a high and sustainable market share, should attract potential competitors to enter the market unless there exists significant barriers to entry. This is especially relevant to the case for HKCG which is not a franchised operation. It is therefore necessary to examine factors that may serve as barriers for new entrants in the piped gas supply market.

4.14 The success of a new entrant to the piped gas market depends on its access to consumers in Hong Kong. Since gas is delivered only through transmission piping, the new entrant must be able to deliver gas through access to the current network, or build its own transmission network.

4.15 Building a new transmission network poses great difficulties. First and foremost is the high cost involved. The high initial investment required for a transmission network deters competitors from entering the industry and be able to compete against the economies of scale enjoyed by HKCG with an amortized network. Second, Hong Kong's highly congested underground traffic may not be able to physically support another gas transmission network. Moreover, the building of another network represents duplication. It is neither an efficient use of resources, nor in the interests of the consumer.

4.16 On the other hand, the entrant's ability to access the existing transmission network is contingent upon two factors. First, the gas to be transmitted must be homogenous with that supplied by HKCG, i.e. processed gas. Investment in processed gas production may not be an attractive option since it is gradually becoming an obsolete technology with most of the world switching to natural gas. Currently in Asia, only Hong Kong, Singapore and China suppliers provide Naphtha-based processed gas to their customers.

- 4.17 Another crucial factor lies in the new entrant's ability to gain access to HKCG's network. This is dependent upon commercial negotiation between the new entrant and network operator for a fair and equitable access charge. Government arbitration may be needed if a fair and equitable charge cannot be reached within a reasonable time frame. Alternately, Government could compel opening of the network through legislation. This is a more drastic approach adopted by the U.S. with some success¹⁰.
- 4.18 Under the current market condition, it is therefore unlikely that a process gas manufacturer will be able to enter the market. Hence, a threat from any potential entrant to challenge HKCG's position is remote.

SUMMARY

- 4.19 HKCG is likely to maintain its market dominance. Competitive pressure from LPG and electricity is also limited since they are not perfect substitutes for Towngas. While LPG's competitiveness is constrained by safety legislation, electricity faces a cultural barrier in the cooking fuel market. The costs involved for switching also act as an obstacle to consumers.
- 4.20 With HKCG's extensive distribution network in place, the threat of new entrants to the market is remote.

¹⁰ Arthur De Vany and W. David Walls, 1993, "Pipeline Access and Market Integration in the Natural Gas Industry, Evidence from Cointegration Tests". *The Energy Journal Vol. 14, No. 4*.

V. MARKET BEHAVIOUR

- 5.1 The lack of competition may lead to monopoly behaviour by the dominant player in the form of pricing policy and practice. The pricing behaviour of HKCG¹¹ is analysed in this chapter.
- 5.2 Since there exists no other company in Hong Kong supplying the same type of manufactured gas product, it is not therefore possible to give a direct price comparison of the price charged by HKCG with that of a competitor, as one could if a perfectly competitive market had existed. As a result, Towngas prices are assessed from three perspectives. These include comparisons in changes in the cost of living (CPI), changes in the company's cost structure and pricing practices by suppliers of other types of fuel, i.e. electricity and LPG.
- 5.3 In addition to examining the movement of Towngas prices, other revenue generating activities that are directly or indirectly related to gas supply will also be examined. These include minimum charges, maintenance charges and sales of equipment. These charges have a direct impact on gas users while the consumer's choice of equipment is constrained by the energy supply available to him.

PRICING ANALYSIS

- 5.4 According to the MMC guideline, the historical movement of prices can be used as an indicator to gauge whether a company is behaving like a monopoly. Table 5 shows price changes of Towngas by HKCG since 1985. Price per unit is measured as price per megajoule of Towngas based on a 1,000 megajoule consumption per month. The price under examination is known as the "net rate" which represents the rate per unit actually paid by consumers after adjusting for Fuel Cost Variation.
- 5.5 HKCG has posted steady price increases since 1986. In the ten year period Towngas prices increased by 42%. The significance of this increase will be assessed with regard to:
 - a) cost of living, as measured by CPI(A),
 - b) cost structure of the company and
 - c) the pricing practice of the industry.

¹¹ Guideline (b) provided by the MMC

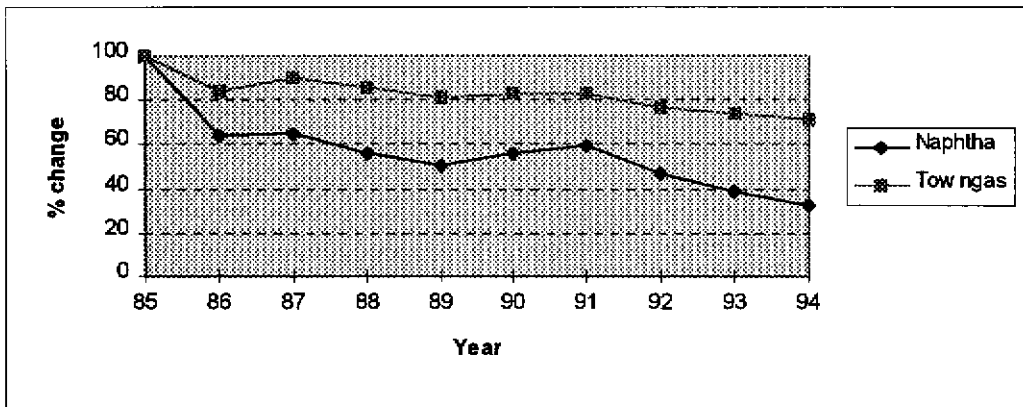
Cost of Living Comparison

- 5.6 Using CPI(A) 1985 as the base year, the inflation-adjusted price of Towngas for 1994 is 71% of the 1985 price level. This indicates a decline in the "real" price of Towngas during this period (Table 5).
- 5.7 Since CPI is designed to measure the cost of a "basket" of goods for a typical household, CPI adjustments only indicate whether the price of a product has changed by as much as the weighted average of the goods in the "basket." Clearly, whether the price of a certain product increased by more or less than the consumer's "basket" is not evidence of the existence or non-existence of monopoly pricing.

Cost of Raw Material

- 5.8 In a market economy, prices are determined by demand and supply; supply in turn is determined by market and the cost of production. A primary component in the production of Towngas is its raw material. From 1985 to 1994, the price of naphtha fell but the annual price increases for Towngas have been above the corresponding price change for naphtha in most years, the only exceptions were for 1990 and 1991 (Table 6). Overall, the inflation-adjusted 1994 price of naphtha is 32.3% of the 1985 price. This is significantly lower than the inflation-adjusted price of Towngas for the same period at 71.1%.
- 5.9 This indicates that whilst Towngas price increases are below that of inflation, they have been above that of its main raw material input. The year-to-year comparison of changes in Towngas and naphtha prices is displayed in Figure 2. HKCG contends that the movement of naphtha is reflected from the fuel adjustment index, hence consumers should be aware of the its impact on price.

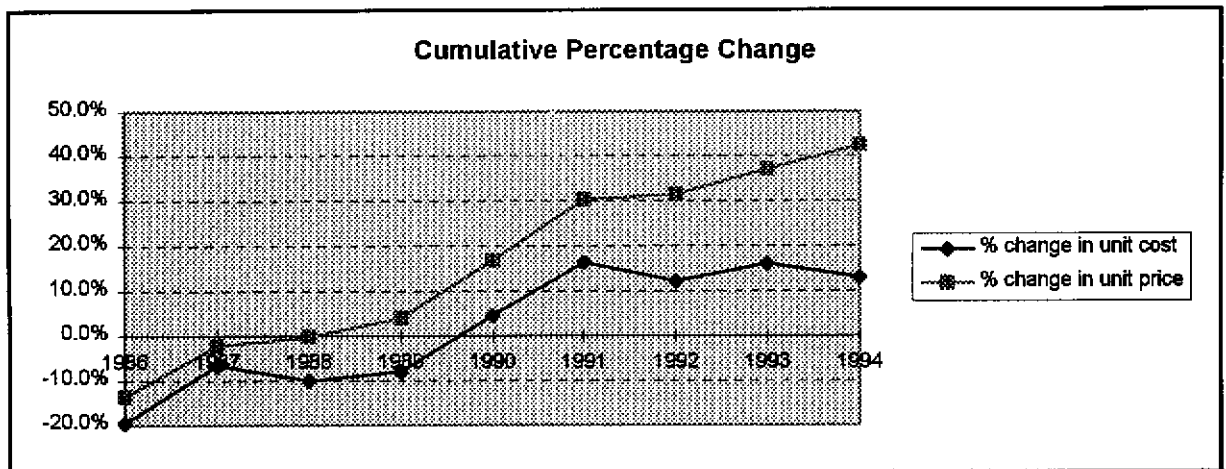
Figure 2 - Annual movements of Naphtha & Towngas prices (1985-1994)



Total Operating Costs

5.10 Since naphtha only represent a fraction of the total cost incurred in the production of Towngas, the change in Towngas prices may not completely follow that of naphtha. Hence, a closer examination of the total cost is warranted. Statistics in Table 7 indicate little change in the unit operating cost in the period of 1985 to 1994. The unit operating cost over the 10-year period has increased by about 13%. This is lower than the 42% increase in price for the same period. In addition, the 1994 inflation adjusted unit cost is 56.3% of the 1985 price level, compared to 71.1% for unit price. These figures indicate that rate of increase for Towngas prices has been higher than that of operating costs (Figure 3).

**Figure 3 - Inflation Adjusted Percentage Change in
Unit Operating Cost & Unit Price (1985-1994)**



5.11 Since price increases have been higher than operating costs, it raises the question as to whether HKCG has engaged in monopoly pricing practices. Prior to coming to any conclusion, it is important to note that a given reduction in cost may not result in a price reduction of the same magnitude since cost may represent only a fraction of the charges being levied. This point is best illustrated with a simple example. If operating cost represents 50% of price and is expected to fall by 10%, the effect of cost on price would be a 5% reduction in price, everything else being equal. In the case of HKCG where the unit operating cost represents only 64% of price in 1992, a reduction in cost by 3.6% should bring about a corresponding price reduction of 2.3%¹².

5.12 Using the same principle, between 1985 and 1994 the price increases by HKCG exceeded that implied by the change in cost structure in seven of the nine years. The estimated dollar impact is reported in (Table 8).

5.13 The dollar-equivalent estimates indicate that had the company been under sufficient competitive pressure and passed all cost savings to consumers, the total annual amount to be passed on would range from \$2.6 million in 1986 to \$87 million in 1994¹³. Such "monopolistic rent" is zero only under a perfectly competitive

¹² This is calculated as $0.64 \times 0.036 = 0.023$.

¹³ These figures are arrived at based on historical accounting data and does not take into account of investment return and investment risk undertaken by the company, nor issues related to service level and safety records by the company.

situation. Companies are normally expected to enjoy some reasonable amount of “monopolistic rent”, especially in the short run.

PRICE COMPARISON

- 5.14 The MMC guideline also suggested assessing pricing practices by looking at differences in price movements between firms in the market. With participants from different utilities in the market, a precise and direct comparison of prices may not be practical. This is particularly true when different units are used for different fuels. The calorific value of each fuel is also different, also different conversion factors used can result in an imprecise comparison¹⁴. There also exists differences in production and transmission efficiency as well as varied equipment efficiency. However, the annual price changes of Towngas, LPG and electricity are being compared to give an overview of pricing practices amongst the suppliers (Table 9).
- 5.15 LPG posts the highest price increases (60.7%) over the period of analysis, from \$11.4 to \$18.3 per cu. metre. This is followed closely by HKCG (42.4%) from 10.6¢ to 15.1¢ per megajoule. Meanwhile, price increases by the two electricity companies are comparatively low at 12.4% for CLP, from 63.0¢ to 69.1¢ per kWh, and 28.7% for HKE, from 62.5¢ to 80.2¢ per kWh. The significantly lower percentage increases by the two electricity companies is attributed to the fact that they are regulated companies.
- 5.16 As a private business, HKCG is free to devise its own pricing strategy in order to derive maximum returns for its shareholders. But the fact remains that price increases have exceeded the rise in operating costs and appear to be high when compared to that of regulated companies. How benefits gained from scale economics and operating efficiency should be divided between consumers and the company poses an interesting question for discussion. Companies are normally expected to enjoy some reasonable amount of “monopolistic rent”, especially in the short-run.

MINIMUM AND MAINTENANCE CHARGES

- 5.17 Customers of both HKCG and LPG suppliers are being charged monthly minimum usage and maintenance fees. The suppliers point out that minimum usage charges cover administrative costs such as account maintenance, while maintenance fees cover the maintenance

¹⁴ The use of conversion factor is a technical issue that is beyond the scope of this analysis. Moreover, different composition can also lead to different calorific value for LPG.

of equipment such as gas meters. Consumers must pay minimum usage charges plus the maintenance fee regardless of usage. Table 11 compares total minimum charges, including maintenance and minimum, by gas suppliers and related utilities in 1994.

- 5.18 Comparison of maintenance charges of all utilities, e.g. electric, telecom etc. indicates that only gas suppliers collect maintenance fees (Table 10, Column 2, Appendix 11). This may be due to safety implications of gas supply. The maintenance charge collected by HKCG is also among the highest in the group.
- 5.19 The maintenance charge of HKCG represents close to 40% of the minimum monthly charge levied. This is a compulsory charge and has been the major source of consumer complaint, despite low aggregate complaint statistics. The company explained that the cost of maintenance was "rolled into" the gas price in 1983.
- 5.20 Between 1986-1989, the maintenance charge was \$3 per household per month. In 1990, this charge was increased to \$4 and has been increasing annually since then.
- 5.21 Between 1986-1994, the average annual compound growth rate was 10.7%. This is higher than the compound growth rate of inflation for the same period of 7.7%. The average compound growth rate is 20.4% from 1989 to 1994. In 1994, each household pays \$7.5 a month. The revenue received from maintenance amounts to \$83.5 million in 1994, representing a 19.1% average annual increase since 1986 (Table 11).
- 5.22 HKCG responded that the service is important in order to ensure equipment safety and the increase rates are necessary to bring the "money-losing" maintenance business into the "black". The \$83.5 million maintenance charge collected in 1994 was used to support 799,181 customer calls for service through the Customer Service Hotline. Of the service calls, 66% required visits, 12% of which needed follow-up visits. In all, the company estimated that the cost per visit amounted to \$133. Based on HKCG's costing figures, the visits alone amounted to \$78.5 million. The difference of \$5 million (\$83.5 - \$78.5) is assumed to be for expenses other than visits. HKCG's annual report does not contain accounting information on this function. Given the expressed concern, this Council considers disclosure of such information desirable to enhance the public's understanding of the company's operation in this area.
- 5.23 Publications by HKCG indicate that the monthly service charge covers:
- a) labour for appliance maintenance and repair,

- b) on-demand appliance check-ups, and
- c) safety inspection for appliances.

Excluded from the service are:

- a) replacement parts for appliances,
- b) replacement of rubber hose for hotplates,
- c) material and labour for repair or replacement of internal gas piping,
- d) repair or replacement of external gas piping (service riser), and
- e) appliance disconnection and reconnection.

5.24 Since only appliance-related maintenance and internal piping inspections are included in the charge levied, this compulsory charge is similar to most maintenance contracts offered by electrical and electronic equipment suppliers. The Company justify this practice on the ground of safety and the concern that the consumer will avoid and delay repairs of hose and piping until the situation becomes critical.

5.25 When compared with LPG suppliers, it is important to note that the maintenance charge for equipment collected by Caltex is optional. Furthermore, the maintenance service of both Caltex and Shell includes external piping and risers. A review of pricing practices with regard to monthly service charges by HKCG does therefore suggest that these charges may be warranted.

INSTALLATION CHARGES

5.26 HKCG also collects installation and disconnection charges to cover labour and material costs. Two gas suppliers and Hong Kong Telecom collect installation charges. The charges by HKCG are relatively high in comparison to other gas suppliers. Shell only takes a refundable deposit from its customers instead of charging for labour and material.

EQUIPMENT SALES TO CUSTOMERS

5.27 One revenue source for HKCG is from its sales of Towngas compatible appliances. While HKCG is not the only supplier or installer of Towngas appliances, it has captured 90% of sales in the market facing no real competition in the equipment market. HKCG's marketing effort certainly contributes to this success. However, since

appliances must be tested for safety before being approved for sale and equipment sold must be installed by a trained technician, it is uncertain whether competition from other suppliers may have been discouraged as HKCG is the major provider of testing and installation services, or it is because the market is too small to be attractive.

- 5.28 The percentage of revenue derived from the sale of equipment by HKCG has decreased marginally during the ten year period, 1985 to 1994, from 15% to 14% (Table 13, Appendix 15). Dollar volume, however, grew from \$149.1 million to \$521.5 million, representing an increase of over 300%.
- 5.29 The evidence obtained supports that HKCG may possess dominant power in the equipment sales market, HKCG does command an obvious advantage over its competitors by providing convenience to consumers. This could explain the small number of competitors in the market.

TRADE PRACTICES

- 5.30 The market behaviour of a dominant player is an important indicator to assess whether it has exercised market power and creating barriers to fair competition detrimental to public interest. Such practices, if they exist, are against public interest and should be addressed. This section examines the trade practices of HKCG to ascertain whether it has exploited its dominant position.

Alleged Anti-competitive Practices

- 5.31 According to information provided by China Light and Power Co., Ltd. (CLP) since March 1990 the company has started its attempt to penetrate the residential water heating market. It negotiated with private developers for "the supply and installation of 18 kW instantaneous water heaters free of charge ... up to two water heaters per flat." These heaters "will be owned by developers once installed." The electricity company will also "provide to the developers financial assistance which in principle equals the additional cost of upgrading the rising mains and wiring of the building due to adopting 3-phase instantaneous electric heaters." In return, "the developers will sign over the ownership of the rising and lateral mains up to energy meters to CLP."
- 5.32 In response to the promotion initiative by the electricity company, HKCG countered by offering developers a "subsidized" cost for the

installation of gas supply piping for the developers adopt gas supply for both cooking and water heating in an effort to defend their market share. Confidential trade documents provided to the Consumer Council indicates that HKCG quoted the cost of gas installation at "a subsidized cost", inclusive of water heaters for each flat. The cost increases by 61.5% "if HKCG fuel is adopted for cooking only." CLP suggests that, by this action, HKCG has abused its monopoly position in the market.

- 5.33 Such marketing strategies by the two companies have two implications. First, by giving away appliances, the two companies would be able to secure additional customers in using their respective energy over a long period. Other customers, however, may have to "cross-subsidize" such offers. Second, both cases also present an interesting case study to see whether such practices constitute evidence of unfair trade practices.
- 5.34 The beneficiary in these practices will be the developer. The consumer has no say in this process and becomes a "captive" customer thereafter, other than paying a switching cost, if technology permits. Whether the benefit received by developers will be passed onto consumers depends on the competitive environment in the private housing market.

SAFETY AND CUSTOMER SERVICE

Safety Record

- 5.35 Gas is a highly flammable substance being used by a large number of households in Hong Kong and the effect of any sizable leakage can be severe. This explains the existence of the Gas Safety (Gas Supply) Regulation.
- 5.36 Towngas supply has generally been safe and reliable and the Gas Standards Office is apparently satisfied with HKCG's high safety standards and its safety records. One major incidence occurred in late 1994 when the gas supply for the whole of Tuen Mun and Yuen Long had to be shut down for the repair of a punctured main caused by a third party. The emergency repair was carried out efficiently. However, the gas supply was not available to households for a few days until the company's workmen had made certain that all household appliances were turned off by going from household to household. This was to ensure that pressure could be maintained at a safe level at the time when the supply was turned back on.

APPENDICES



Consumer Complaints

- 5.37 Utility companies in the energy sector in Hong Kong all have a strong performance record in customer services. Consumer complaints received by the Consumer Council against HKCG are few, complaints are mainly against the company's maintenance charge.
- 5.38 Part of the reason for the criticisms of the maintenance charge is consumer confusion over the nature of the charge and the specific services that are under the coverage. This is the case despite the fact that specific terms included in the maintenance are clearly spelled out in the company's brochure (see para. 5.17 - 5.23 and Appendix 16).
- 5.39 Since 1994, HKCG initiated a "Towngas Service Pledge" programme committing itself to provide an efficient, reliable and friendly service. The performance results shown in which is measured against set performance targets. Appendix 16 indicates that HKCG is fulfilling its pledge by a high percentage.
- 5.40 As can be seen from the performance statistics provided by HKCG, the company has a good overall service record. The company reaffirms its commitment to its customers by stepping up its service pledge for 1995.

SUMMARY

- 5.41 We have assessed the pricing practices of HKCG for Towngas supply and related products and services from a variety of perspectives. These include comparisons in changes in the cost of living, changes in the company's cost structure and pricing practices by other fuel suppliers in the market.
- 5.42 Our analysis concluded that:-
- a) the price increase of Towngas since 1985 has been below increases in CPI(A), but
 - b) the level of price increases have been well above the increase in costs, and
 - c) price increases for Towngas are lower than LPG but higher than that of electricity.

5.43 In general, service provides to customer by the three utilities (CLP, HKE and HKCG) are satisfactory. However, the marketing practices employed may involve "cross-subsidization" and unfair trade practices.

VI. MARKET PERFORMANCE

- 6.1 One issue of consumer interest is whether HKCG has attained exemplary corporate performance on account of its market dominance. In industrial economics, corporate performance is gauged according to corporate growth and corporate profitability. Corporate growth is assessed by asset growth as well as sales growth, while profitability is gauged by return on sales, return on assets and return on equity. Return on sales is an appropriate measure of operating profitability. Return on assets is a measure on net profitability, taking into account of interest costs and taxation. Finally, return on equity measures return to shareholders who represent the owner of the company. Return on equity will differ significantly to return on assets when debt financing represents a significant growth strategy of a company.

CORPORATE GROWTH¹⁵

- 6.2 Compared to CLP and HKE, HKCG has achieved superior growth in both assets and sales. Total assets increased by 822.5% over the ten year period (1985-1994) while sales increased by 374.2%. These figures compare strongly against those of CLP (214.5% in asset and 130.0% in sales) and HKE (322.3% in asset and 147.6% in sales Table 14).
- 6.3 The strong growth rate is reflected by the fact that HKCG displays the highest rate of increase in assets in seven out of nine years. The most significant increase is reported in 1993 at 110.4%. Part of this extraordinary rate of increase is due to the recognition, in 1993, of appreciation in value of the company's land and leasehold properties. The company revaluated this property to reflect the true market value.
- 6.4 To allow direct comparison of asset growth for the three companies, adjustments have been made to exclude the land revaluation, the adjusted figures are reported in Table 14. After adjusting for the revaluation, asset growth for 1993 and 1994 are 31.7% and 16.5%, respectively. Both of these figures indicate strong growth by HKCG when compared to CLP and HKE for the period. This is further supported by the total growth rate for assets of 374.3%, with an average annual growth rate of 22.5% for the period. These figures

¹⁵ Only items under S.O.C. are considered for this analysis for CLP and HKE to facilitate comparison with HKCG since the core business of the latter is mainly in gas supply.

suggest that even without the revaluation, HKCG still achieved superior growth when compared to the other utilities.

- 6.5 Sales growth for HKCG again reported a remarkable record over the period, showing over 10% growth in eight of the nine years. Except for 1986, the company also has the highest sales growth in six of the nine years when compared with CLP and HKE for the same period. (Table 14)
- 6.6 The strong growth rate is the result of a number of factors including superior management in marketing, sound investment strategies, and socio-economic changes. The growth is partially explained by the fact that with a well-established network in place which provides the company a strong incentive to focus on growth as the marginal cost to provide service to an additional customer is likely to be low.
- 6.7 As far as profitability growth is concerned, both revenue and profit of HKCG post steady growth from 1985 to 1994. The after tax margin on sales grew from 18.6% in 1985 to 36.8% in 1994 and operating margin for gas sales grew from 27.8% to 69.2%. These figures not only indicate exemplary performance by HKCG but also the company's ability to sustain and increase profitability over a period of time¹⁶ (Table 15).

PROFITABILITY COMPARISON

- 6.8 A closer look at the company's growth indicates that the growth was achieved under increasing profitability. Commonly used methods to assess corporate profitability include Return on Sales (ROS), Return on Assets (ROA) and Return on Equity (ROE).

Return On Sales

- 6.9 With regard to profitability as measured by profit per dollar on sales after tax, HKE has the highest, and CLP the lowest, amongst the three companies. HKCG displays the most rapid growth. As can be seen from Table 15 & 16, the after tax margin for HKCG at 1985 was 18.6%, marginally lower than that of CLP. By 1994, the same figure for HKCG is at 36.8% as compared to 28.3% by CLP.

¹⁶ For 1994, the after tax profit margin is 36.8%, while operating margin on gas sales is 69.2%

Return On Assets

- 6.10 Comparing their return on assets (ROA) and return on equity (ROE), for CLP and HKE the figures are adjusted to allow reasonable comparison. Figures related to Schemes of Control activities for CLP and HKE are used to compare against HKCG activities. Asset figures of CLP and HKE were obtained from the respective companies and verified with the Economic Services Branch of the Government. HKCG figures were obtained from its annual report.
- 6.11 The financial figures used for CLP and HKE exclude Non-scheme of Control operations. Direct comparison of financial figures on the Group accounts of CLP and HKE against HKCG is not appropriate as the Group Companies (power companies) also engage in other Non-scheme of Control activities not related to the supply of electricity in Hong Kong, e.g. Daya Bay Plant for CLP and the property development business of HKE.
- 6.12 On the other hand, HKCG's business is primarily in gas supply because figures for China activities are not separately available and the business represents an integral part of HKCG.
- 6.13 We recognize that the HKCG Group include China activities, while such activities are excluded in CLP and HKE figures. We note their China activities are relatively recent happenings, the impact on the overall business portfolio of the company is also smaller. Hence, our figures should serve as reasonable indicators of the relative profitability of the three companies.
- 6.14 For ROA calculation, the asset figures of CLP and HKE were obtained from the total fixed asset figures in the annual reports of the respective companies. Total fixed assets were used instead of net fixed assets as prescribed by SOC because
- a) net fixed asset figures for CLP and HKE are not disclosed, and
 - b) HKCG is not under Scheme of Control.
- Hence there is no net fixed figures available.

- 6.15 Apart from year-to-year variations, the average non-SOC ROA figures of the three companies are generally comparable. The ten year average returns for CLP, HKE and HKCG are 11.8%, 11.9% and 14.1% respectively, indicating that HKCG has higher average earnings over the period¹⁷.
- 6.16 Additional insight can be obtained by examining the annual growth rate of fixed assets of the three companies. This is important since changes in asset value are a significant component in the calculation of ROA. This is most evident by looking at the ROA figure for HKCG in 1994. The 9.6% return is a much lower figure than the historical average. The main reason behind this was not a reduction in profit earned, but rather land revaluation by HKCG in 1993, resulting in HKCG's highest asset growth rate for the year.
- 6.17 A more accurate view on investment growth can be obtained by examining the growth rate of plant and equipment. The average annual growth rate for fixed assets, such as buildings, plant and equipment, mains and services combined amounts to 30.4% for the ten years between 1985-1994. This compares favourably against the two electricity companies at 9.5% and 14.3% for CLP and HKE, respectively. These figures provide support to the view that, among other things, the significant growth in profitability by HKCG is due to its consistently increasing investment in the territory. (Table 17)

Return on Equity

- 6.18 Table 18 reports the return on equity figures for the three companies. While HKCG reported the lowest average ROE of the three companies: 22.4% as compared to 27.5% and 28.0%, by CLP and HKE, respectively. It is the only company displaying a consistently upward trend for the period with the exception of 1993. More significantly, this is achieved despite an upward trend in equity growth. This evidence provides support to the view that HKCG is profitable with healthy growth in profitability.
- 6.19 The better performance by HKCG in ROA and ROE can be fully explained by the capital structure of the company. HKCG employs less debt in the financing of its business operation than the other two energy utilities. HKCG has employed only one debenture financing in 1993 during the ten year period. This significantly increased its equity base, hence reducing the return to individual shareholders.

¹⁷ Since the ROA of CLP and HKE are calculated on total fixed assets and not net fixed assets as prescribed by the SOC, the reported returns for CLP and HKE are lower than the 13.5% permitted returns as specified under the SOC.

The use of pure equity financing is considered a very conservative financial policy in the literature since this is a more costly type of financing^{18,19}. This capital structure is also considered as suboptimal since shareholders' return is not maximized. This is clearly illustrated by the significant difference in ROA and ROE figures for the three companies.

- 6.20 In addition to comparing returns of HKCG with domestic utilities, Table 20 compares returns of the parent companies of three LPG suppliers, quoted from all Fortune 500 companies. Returns by HKCG compare favourably with the parents of LPG suppliers. While the business portfolios of these companies are very different to those of HKCG, these figures nevertheless offer a benchmark for comparison of profitability between LPG suppliers and HKCG.

INTERNATIONAL UTILITIES

- 6.21 To further assess the implication of HKCG's market dominance on profitability, an earlier report examined the profitability by utilities internationally (Table 21)²⁰. The return by HKCG is generally much higher than many public utilities from most parts of the world. It is also found that most utilities from other countries achieve significantly lower returns than Hong Kong utilities. Foreign utilities with the highest returns are the U.S. with an average return on assets at below 5% and return on equity at around 12%. These figures are significantly higher than the average for the other countries at 2% and 7.6% respectively. However, the U.S. figures are still much lower than the average figures obtained by Hong Kong utilities, at 21.1% and 28%, respectively²¹. Putting it into perspective, this means that return on assets by the average Hong Kong utility is over 10 times that of the world and the average return on equity is 3.7 times. HKCG has achieved even better results .
- 6.22 Given the result that U.S. utilities are among the most profitable in the world, other than Hong Kong, an updated analysis with a larger sample over a longer period for U.S. utilities is presented in Table 22.

¹⁸ Copeland, Thomas E and J. Fred Weston, 1988, *Financial Theory and Corporate Policy*.

¹⁹ Miller, Merton H., 1989, "The Modigliani - Miller Propositions after Thirty Years," *Journal of Applied Corporate Finance*.

²⁰ Monitoring of the Gas Supply Industry, Project Report, Senior Staff Course No. 20, 1993.

²¹ The Higher return in Hong Kong may be associated with higher risk elements such as political uncertainty. the impact of political and business risks on cost of capital is assessed in the next section.

Results indicate that HKCG is highly profitable when compared to the top five utilities (by revenue size) in the U.S. in terms of return on revenue and return on assets in 1994. Moreover, HKCG provides superior profitability consistently over a period of 10 years.

- 6.23 International differences exist as a result of differences in economic, operating and regulatory environments. However, the above analysis should provide an insight into Hong Kong's utility pricing and profitability.

PROFITABILITY AND THE COST OF CAPITAL²²

- 6.24 The high rate of return by Hong Kong utilities may be closely related to the cost of capital raised from the domestic financial market. If fund providers in Hong Kong require a higher return from domestic companies due to economic and political uncertainty, local firms must pay the higher required rate to obtain the necessary financing. Table 24 compares the requisite rate of return on equity²³ (cost of capital) and return on equity of selected utilities.
- 6.25 The domestic financial market condition does appear to contribute to a high cost of capital financing. The average market required rate of return for the utilities is 23.5%. This is significantly higher than the 12% average return in the U.S. equity market.
- 6.26 After taking into account the financial market condition leading to the high capital cost in Hong Kong, return in excess of that estimated according to financial theory prevails. Among the three energy utilities, HKCG yields on "excess return" of 1.3%. This figure is comparable to the other two companies. The company with the highest premium is HKT. However, anticipated competition from telecommunication deregulation will challenge HKT's ability to sustain the present level of profitability (Table 23).
- 6.27 The above analysis provides evidence of superior profitability by HKCG as compared to other utilities. This evidence, together with market share, pricing and cost evidence obtained in previous sections, gives credence to the following views:

²² Cost of capital is loosely defined here as the required rate of return on equity by investors. This is acceptable in this analysis since debentures are not used in most companies., the only exception being HKCG who only started using debt financing since 1993.

²³ The required rate of return is estimated using the Capital Asset Pricing Model. The three year average one-month HIBOR reported in the Hong Kong Economic Journal (1992-1994) is used to estimate the risk-free rate. The three year monthly average return of the Hang Seng Index is used to estimate the market return. Betas are obtained from HSI Services Limited.

- a) the main contributing factors for the significant profitability growth by HKCG are
 - significant growth in investment, and
 - growing differential between price charged and operating cost.
- b) the existence of a relationship among the company's market share, its pricing practice and superior profitability.

6.28 Due credit and recognition must be given to HKCG. It has clearly worked very hard to increase its market share through sound economic policy, prudent investments and effective management. The shareholders would have every reason to feel very satisfied with such a performance. By its strong performance HKCG has attained market dominance and has evolved into an unregulated natural monopoly. Therefore the time has come for Hong Kong to evaluate critically how best to balance consumer interest and business interest bearing in mind the market environment in the future. The objective is to achieve a win-win situation for both parties that maximizes economic welfare in the long run.

SUMMARY

6.29 The lack of true competition provides impetus for HKCG's superior performance in growth and profitability. Corporate growth is assessed by asset growth as well as sales growth. Profitability is gauged by return on sales (ROS), return on assets (ROA) and return on Equity (ROE). Evidence indicates that HKCG has achieved high growth and superior profitability.

6.30 HKCG reported the highest ROS figure for 1994 at 69.2%. The estimated ROA and ROE figures for the company are also higher than those of CLP and HKE as well as a number of international utilities and companies.

VII. PROMOTION OF MARKET COMPETITION

- 7.1 Promotion of market competition is often prescribed as the solution to market dominance by a monopoly. In the energy market, consumers view competition as the ability to choose and switch to a supplier that is safe, reliable and offers reasonable charges. Competition among fuel suppliers will drive fuel prices down for consumers. The implications of promoting "market competition" in the water heating and cooking fuel supply markets from the consumer's perspective has to be examined.

COMPETITION BETWEEN ENERGY SUPPLIERS

- 7.2 Competition between LPG, Towngas and electricity is constrained by their different properties, distribution network and regulatory requirements as shown in Chapter 4. Hence they are not perfect substitutes for one another.
- 7.3 There is only one supplier each for electricity, either CLP or HKE, depending on the consumer's place of residence and HKCG is the sole supplier of manufactured gas. This serves to explain why the power companies are subject to Government regulation.

THE COMMON CARRIER ALTERNATIVE

- 7.4 For over one hundred and thirty years, HKCG has been the only producer of manufactured gas. The huge infrastructure investments on the manufacturing plant and distribution system have been the major barrier to entry for potential competitors. Experiences overseas have shed light on introducing competition by adopting a common carrier system through which new entrants are allowed to have access to the transmission piping network at a price.
- 7.5 A common carrier system allows different suppliers of the *same* type of gas to serve their customers through a shared distribution network. With an accessible distribution network in place, new entrants wanting to compete in the market can do so with smaller initial investment by just bringing in gas sources, thus lowering the barriers to entry. The sharing of a distribution network also avoids duplication. In addition, the common carrier concept is especially appealing in Hong Kong's environment where public utility installations beneath roadways are already congested.

- 7.6 It is not practical nor economically viable to expect a new entrant to invest in a new plant to manufacture gas, the option of introducing natural gas is therefore almost a prerequisite for Hong Kong to benefit from a common carrier system. Natural gas is already widely used in Japan, Korea, Taiwan, U.K. and the U.S. In fact, the U.S. has been using natural gas as a energy source since 1952²⁴. Common Carrier for gas transmission and distribution is used in Australia and the U.S. The common carrier system is currently under review by the legislature in the U.K. and is expected to pass the legislature before the end of the 1995.
- 7.7 It is not practical nor economically viable to expect a new entrant to invest in a new plant to manufacture gas, the option of introducing natural gas is therefore almost a prerequisite to benefit from.
- 7.8 The common carrier concept in Hong Kong is not a new idea. As of July 1st, 1995, upon expiration of Hong Kong Telecom's monopoly franchise for its fixed network service (FTNS) license, HKT is opening up its network for new FTNS operators at an access charge. Thus the new entrants to the telecommunication market need not invest in the construction of a duplicative network. As stated by OFTA, the telecommunication common carrier system is used to facilitate "equal opportunity to supply services to customers of other FTNS licensees on a basis which is economically and technically efficient and non-discriminatory as between the licensees in terms of functionality, quality and performance."²⁵
- 7.9 Experience of implementing the common carrier concept in the telecommunication industry indicates that more attention need to be given to the setting of a fair access charge for the use of existing transmission system. In the telecommunication industry, access arrangements (both technical and financial) are to be "settled by negotiation between operators." However, statutory power is given to the Telecommunications Authority to "determine the terms of interconnection" should the operators "fail to reach agreement within a reasonable time."²⁶ In other words, if HKCG were asked to open up its distribution network to other suppliers, it will have the opportunity to negotiate for and receive an access charge from any supplier of natural gas as compensation for the use of its resources.

²⁴ Pakistan is also one of the earlier country to adopt natural gas as an energy source in 1954.

²⁵ Statement by Mr. Alexander ARENA, The Telecommunications Authority of Hong Kong - Interconnection and Related Competition Issues, Statement No. 4-20 May 1995: Carrier-to-Carrier Relationship, Principle No. 8.

²⁶ Guidance Note for the Submission of Proposals for the Operation of Fixed Telecommunication Network Services in Hong Kong.

The Natural Gas Advantage

- 7.10 Introducing natural gas to Hong Kong will facilitate competition through the common carrier system. The increase in natural gas usage by other countries in recent years has been driven by a number of factors. First, natural gas is a more efficient energy fuel with almost twice the energy content of Towngas per cubic foot. Second, it is non-toxic and a cleaner burning gas than Towngas or LPG and is therefore more desirable from an environmental perspective. With no interim processing and production, natural gas is also a cheaper source of fuel for consumers. The minimum production costs also make it easier for potential competition to enter the market. Finally, transmission piping for natural gas is standardized and can be used as a common carrier.
- 7.11 Natural gas is also a cheaper source of energy. Comparisons between Australia, Canada, Singapore, U.K. and U.S. illustrate that the average price of gas where natural gas is supplied tends to be lower than in countries where towngas is supplied (Table 24). Base on the data obtained, it is estimated that the annual savings for Hong Kong from switching to natural gas could be around \$97 million²⁷ or \$11.6 million²⁸.
- 7.12 Although some efforts would be required for Hong Kong to adopt natural gas, the cost of not switching means continuous reliance on a technology of the 50's and 60's for the territory. From a safety, economic, environmental and technological view point, natural gas offers a good alternative fuel source.
- 7.13 The U.K. converted from manufactured gas to natural gas in the late 60's and early 70's. Endowed with an ample supply of natural gas just off the shores of the British Isles, conversion was a relatively straightforward process. With a density lower than manufactured gas, natural gas can be readily transmitted over the existing distribution network. This eliminates the need to rebuild or upgrade. The only cost required for conversion is therefore the material and labour costs of replacing a valve for appliances in each household, due to a different thermo value. Therefore, conversion was clearly justified by safety and economic reasons.
- 7.14 In the case of Hong Kong, the supplier needs to secure a long term natural gas supply from nearby territories like China and Indonesia.

²⁷ Estimated base on the average gas price in Canada and domestic household consumption in Hong Kong in 1994.

²⁸ Estimated base on the average gas price in Singapore and domestic household consumption in Hong Kong in 1994.

HKCG made attempts to securing a close-by natural gas source as early as 1986. Meanwhile, CLP has recently secured a contract to bring natural gas from South China Sea via pipeline for power generation purpose.

- 7.15 If a natural gas source cannot be identified nearby, the supplier can bring natural gas from more distanced countries, e.g. the Arabs, in the form of liquefied natural gas (LNG). However, the importation of LNG can incur significant investments in transportation and storage.
- 7.16 In the U.S., the use of natural gas and the introduction of the common carrier have yielded significant benefits. Gas suppliers in the U.S. were regulated as regional monopolies up until 1985. Since deregulation, the separation of natural gas supply from its distribution network provided open access to gas suppliers and created a competitive market. The results are significantly lower prices as well as national price convergence among the various regions.
- 7.17 Likewise, consumers in Hong Kong can benefit from the introduction of natural gas to the territory, therefore, HKCG should be encouraged to bring such a cheaper energy source to Hong Kong. To induce competition, the Government should consider devising a feasible scheme to open up the gas distribution network.
- 7.18 Once conversion takes place, HKCG may separate its supplier/manufacturer function with its network operation and becomes supplier of natural gas as well as the common carrier to other gas suppliers. Under this system, consumers can switch gas supplier without being restricted by the transmission equipment already installed in their residence, hence promoting competition in the gas supply market. The liberalization experience of the U.K. gas market and the Hong Kong telecommunication market, both currently in progress, should provide most valuable insights to Hong Kong.

SUMMARY

- 7.19 To promote competition in the gas market, the Government should take positive steps to devise a feasible scheme to open up the gas distribution network as "common carrier" for suppliers of the same type of gas. At the same time, the Government should encourage industry players to bring natural gas to Hong Kong.

VIII. A REGULATORY OPTION

- 8.1 Many industrialized economies regard gas supply as an essential utility and subject them to regulation. The cost versus the benefit gain from regulation is fully evaluated before the decision was made.
- 8.2 As HKCG is becoming a “natural monopoly”, it raises a crucial question whether HKCG, like other major utilities, should be subject to some form of regulatory control to ensure fair price, safety, quality of service and reliability of supply. There is also an equity reason, HKCG is the only major utility currently not regulated by the Government.
- 8.3 HKCG holds the view that regulation is costly, which only benefits competitors rather than consumers while restraining its ability to compete in the free market. As well illustrated in earlier discussions, “free market” in energy supply does not exist due to technical, legal and cultural constraints. Even in the transportation market where the different transportation modes buses, taxis, MTR, etc., are substitute of one other, the fare increases are subject to regulation, Government approval is required for fare increases for buses and taxis whilst MTR a fully owned subsidiary of Government, is expected to act in the public interest for fare adjustments.
- 8.4 HKCG’s concern over regulation costs can be addressed by the pooling of resources in the Energy Commission proposal and the cost effective price-cap regulatory model. This will be discussed in detail below.
- 8.5 It may be argued that the regulatory option is always available to the Government and should only be exercised only if the company is not behaving in a socially responsible manner. While Government does have such a prerogative, a responsible Government must act pro-actively to safeguard public interest.
- 8.6 Since introduction and implementation of regulation involves significant time lag, it is impractical to ask the Government to “wait-see” despite a prima-facie case has been established for action. The Council is thus of the view that, based on public interest grounds, regulation is justified. The Council also believes that a fair and efficient regulatory structure would ensure a win-win situation to consumers as well as the company.

DEFINING THE SCOPE OF REGULATION

- 8.7 Companies participating in the water heating and cooking fuel market offer a variety of services, including direct utility services such as the supply of gas, installation of necessary pipework and support services closely associated gas supply. These include the supply of meters, meter reading and billing, emergency callout for gas leaks etc. They may also be active in related business such as sale of gas appliances and provide maintenance service for them.
- 8.8 Most regulatory frameworks focus strictly on the utility service and this may be expanded to include meter reading and billings, unless competition is otherwise in place. It is necessary to include these services in the price and service quality control regime. Other services and the associated costs are excluded, for example, any fully 'commercial' activities of the industry, such as appliance sales and repair, are to be excluded from price control, even if the company may hold a *de facto* scale monopoly in these areas. To summarize, all non-utility sources of profit or loss should be excluded from the regulatory system.
- 8.9 The industry's accounts must clearly separate the regulated and non-regulated activities by adopting an equitable formula of cost sharing for the common costs. An example of this would be property held by the company as an operating base for its business, but is capable of being used for other purposes or traded as an asset in its own right. The separation of such costs is essentially a technical accounting issue. The principle should be that profits and losses are only taken into account in the regulatory regime if they are incurred as a direct and inevitable part of carrying out the core utility business of supplying gas through pipes.

SIGNIFICANT CRITERIA FOR A REGULATORY SYSTEM

- 8.10 Eight criteria are proposed for the design of a regulatory system:
- a) It should be explicitly charged with representing the interests of all consumers and protecting them from monopoly abuse.
 - b) It should divide customers into broad classes for regulatory purposes, namely, consumer, commercial and industrial.
 - c) The regulatory rules should include prohibitions against 'undue preference' towards, or 'undue discrimination' against different classes of consumer.
 - d) It should encourage efficiency in operational terms and in terms of investment and innovation.

- e) It should not impose excessive costs or burdens on either the taxpayer or the regulated industry.
- f) It should allow the specification of 'public interest' requirements which the industry must perform.
- g) It should explicitly allow sufficient returns on capital.
- h) Investors have the right to expect reasonable continuity and certainty in the regulatory environment.

8.11 In Hong Kong, there are two commonly used forms of control, namely, profit control and price control. The pros and cons of each scheme is evaluated below.

PROFIT CONTROL

8.12 Profit control in one form or another has been most common in industrialized economics regulating utilities throughout most of the twentieth century. In Hong Kong, profit control has been implemented in the form of Schemes of Control (SOC) for a number of public utility companies.

8.13 Many variations of profit control have been used and some common essential features can be identified. Profit control means imposing a permitted return rate on the regulated company. For example, the permitted return under the SOC for both electricity companies are "(a) 13.5% of the average net fixed assets; and (b) 1.5% of shareholders' investments made after a defined date for acquiring fixed assets."²⁹ Any difference between this return and the profit after taxation is to be transferred to or from a development fund.

8.14 Profit control requires the regulatory body to form a view on the allowable expenses of the industry, the capital rate base and the rate of return on that base needed to fund the industry into the future. In Hong Kong, CLP and HKE are subjected to profit control schemes, their maximum allowable return of assets are stated in the Schemes of Control statement.

8.15 Different countries use different 'trigger points' to review their schemes. This may be annual reviews, reviews triggered by returns exceeding a maximum 'ceiling' or if the industry applies to vary its tariffs. Profit control should provide reasonable returns to investors. It should also provide investors with relatively high levels of continuity with the rules applied consistently over a period of time.

²⁹ Schemes of Control , 1993.

- 8.16 The nature of rate-of-return control is that it tends to concentrate on profits and profits may not be a very useful focus for regulators. In the context of a monopoly company, "super normal profits" profits may be an indication that abuse of consumers may be taking place. An alternative explanation may be that the company is very well managed.
- 8.17 This last point brings on the question of efficiency. Restraining rates of return will reduce the incentive for managers to improve efficiency. In a competitive market, dramatic improvements in operating efficiency by one company will lead to super-normal profits in the short-term, with the expectation that these will be 'competed away' to the advantage of consumers when other firms adopt similarly efficient practices.
- 8.18 In a profit-controlled industry a sizable part of any efficiency gains will be confiscated by the regulatory system. While consumers are protected from one potential form of exploitation, they may not be protected, or at least not effectively protected, from exploitation known as 'managerial slack': the failure to control input prices as rigorously as they should.
- 8.19 Another form of inefficiency in a return control scheme was first revealed by Averch and Johnson in 1962³⁰. Known as the A-J (Averch-Johnson) effect, the authors found that firms under return control schemes would tend to choose too much capital inputs relative to other inputs. A classical example is the incentive for utilities to invest in expanding their own capacity to meet peak demands rather than purchasing power from nearby companies, although it may be less expensive to choose the latter option. This is so since the latter are treated as expenses which are simply "reimbursed", while the former is regarded as asset providing the utility a return at a rate specified under the return control scheme.
- 8.20 There is also evidence that profit-control systems tend to be costly to administer. The regulatory body is likely to be drawn deeply and permanently into the question of whether particular parts of the industry are operating as they should, or whether certain past investments were prudently undertaken.

PRICE-CAP AS A REGULATORY TOOL

- 8.21 An alternative to controlling profits is to control prices directly. Under such a system, the regulatory system specifies in advance the rate at

³⁰ H. Averch and L. Johnson, "Behavior of the Firm Under Regulatory Constraint," *American Economic Review*, December 1962.

which prices for given 'baskets' of services can move. These rates are reviewed at set intervals, for example, once every three years.

- 8.22 On close examination, the difference between prices-based and profits-based regulatory systems is perhaps less extreme than it appears. Both systems take a view of the 'correct' level of the price formula³¹.
- 8.23 The price formula approach set prices directly. This is a more efficient approach from a regulatory perspective since the regulator is not given the burden of having to determine the level of "fair" return for the company.
- 8.24 Secondly, under the price formula approach, managers and shareholders in the industry would have a much stronger incentive to seek out efficiency gains if the profit could be retained by the company or passed on shareholders in their entirety until the next review.
- 8.25 By taking a direct approach to prices, the price formula offers director safeguards to consumers. Whether the prices are at 'optimum' levels, will depend on the skills and rigor of the regulator. On balance, a price control system appears the best option for most industries.
- 8.26 The only exception is an industry where rapid technological advancements can lead to a significant reduction in cost in a short period of time. In such a case, price control may not yield the results desired. Other issues still need to be considered. These include the broad nature of the price-control formula to be adopted, a definition of services to be regulated and more specifications on the control of quality which is particularly important in price control regimes.

A Price Formula

- 8.27 At its most basic, a price control formula sets the maximum rate at which tariffs can increase by reference to the general measures of local inflation, i.e. $CPI - X$. In this case, price increases are automatically adjusted according to a predetermined set of criteria, and no annual review and approval is required unless there exists signs that the system is not working efficiently. This system of control is already in place for Hong Kong Telecom.

³¹ In Hong Kong, price increases by companies under the Schemes of Control are reviewed periodically. For example, Executive Council approval is required for the bus companies before bus-fare can be raised.

- 8.28 The Consumer Council considers the price control approach suitable for the case for HKCG since it provides the company opportunity to profit from efficiency gains, while consumers are offered price protection.
- 8.29 For HKCG, the CPI-X formula would specify that, over a defined period, . HKCG would not be permitted to raise the average price of gas services by more than CPI minus X: if X turns out to be greater than the general rate of inflation, the gas price will fall in dollar terms.
- 8.30 In setting X, the regulator, would need to take account of a wide range of circumstances including the prospects for growth and efficiency gains within the industry. X is normally less than the actual efficiency that can be achieved so that the company benefits also from the efficiency gains.
- 8.31 In industries with a large primary material production cost as in the case of coal in electricity generation in Hong Kong or naphtha in the case of manufactured gas for HKCG naphtha, an additional 'Y' factor could be added³². This factor allows changes in primary material costs to be passed through to consumers more directly. Whether this should be passed on in total is subjected to debate³³. It depends on the extent to which the purchase of primary materials is seen as being an uncontrollable cost from the industry's point of view.
- 8.32 The CPI - X concept is used in both Australia and Britain. In Australia, the price for gas is set according to the formula

$$M = P(CPI-X) + Y + A, \text{ where}$$

M is the new price of gas;

P represents the existing price of gas;

CPI is the inflation rate;

X is the efficiency factor;

Y includes all costs that are beyond the control of gas company, e.g. raw material costs; and

A represents an adjustment factor that allows the gas company to correct for year to year forecast error, e.g. if the company over

³² The fuel cost variation clause currently in the pricing formula of Towngas already states that for every complete multiple of \$1 by which the cost of naphtha rises above (or falls below)\$1,420 per kilolitre, the charge for gas will be increased (or reduced) at the rate of 0.004 of a cent per MJ.

³³ In Britain, the company is expected to absorb 1% of the energy cost as an incentive for the company to negotiate the best deal on behalf of the consumer. However, this is not practiced in Australia.

charged in the previous year, A would represent a downward adjustment of price for the current year.

8.33 When x was set in 1990 in Australia, it was set at 2 for all regions except for Newcastle where it was set at 3.5 (subsequently reduced to 1.5). As a result of the price cap, the average tariffs decreased by 5% in real terms.

8.34 In Britain, the percentage change in gas prices is set according to

$$RPI - X + GPI - 1 + E + K^{34}, \text{ where}$$

RPI is the retail price index;

X represents efficiency factor, this is currently set at 5;

$GPI - 1$ is the gas price index with a 1% efficiency constant to be absorbed by the company;

E is an energy saving element to encourage energy efficient spending; and

K is a service delivery factor to ensure service performance.

8.35 To illustrate, over the past ten years, the average inflation rate for Hong Kong is 8.1%, the average increase in price of Naphtha is 3.2%. The net increase in price for Towngas after accounting for Naphtha is approximately 4.9% (or $8.1\% - 3.2\%$ ³⁵). This is comparable to the 4.2% average increase of Towngas prices. Using the $CPI - X$ framework, the average price increase for Towngas would have been further reduced. Drawing on the only experience in Hong Kong from the telecommunication industry, an efficiency factor of 4% is used for illustration obtained under our assumptions suggests an average price increase of 0.9% ($4.9\% - 4\%$) for Towngas over the period. It is important to emphasize that this is only an illustration and by no means represents that the Consumer Council is advocating a 0.9% annual increase in price for Towngas in the past or for the future.

³⁴ A precise formula to calculate the actual price increase is provided by the formula $M_t = [1 + (RPI_t - 5)/100P_{t-1} + (F_t - Z_t)18.378/100 + E_t - K_t]$, where F_t is the gas price index at base year, and Z_t is an adjustment factor incorporation a 1% fuel efficiency to be absorbed by the company.

³⁵ The weight of Naphtha in the cost structure of the company is not taken into account in this example as the weight varies from year to year. This is likely to overstate the impact of fuel cost on price changes. However, it is also important to note that a utility company is expected to absorb 1 - 2% of any increase in the cost of raw material (1% for the gas company in the U.K.), providing the company with an incentive to negotiate a more favourable contract.

8.36 The actual rate of increase in prices is to be determined by the Government upon further study into the technological and other efficiencies obtainable by the company and consultation with the industry. Factors such as efficiency gain from growth and scale economy must be weighted against management efforts and incentives when setting X. The Government is urged to take all relevant factors into account when assessing the amount of efficiency gains to which the consumer is entitled and bear in mind that the aim of the formula should be to mimic market forces and not to penalize the company for efficient operation from management effectiveness.

8.37 While the concept of CPI - X is easy to follow, more research effort is required before an optimal and specific equation can be determined. Factors to be considered include whether:

- a) changes in raw material prices should be passed completely onto consumers, such as the Australian approach, or
- b) partially passed on as in the British model; or
- c) there should be elements to encourage investment in energy efficiency, improvement in service performance, and mispricing due to forecast errors.

Furthermore, there is also the issue of whether raw material costs and the overall efficiency should be weighted differently.

8.38 An optimal form of price control can deliver benefits that include ease of implementation, economic administration, and maintain incentive for efficiency without sacrificing quality of services. It also delivers the immediate benefit of lowered prices for consumers.

SUMMARY

8.39 In the long run, the benefit from the recommended regulation speed up the conversion from Towngas to natural gas and common carrier (Table 24). This includes the benefit of a cheaper and safer gas with no toxic content, a cleaner environment and price competition from an open gas market. It is likely that a lower price will result not only because natural gas is a cheaper form of energy, but also because market forces will ensure efficient setting of prices.

IX. A CO-ORDINATED ENERGY POLICY FOR HONG KONG

- 9.1** The energy industry is a constantly changing environment. In addition to the issues discussed above, other concerns such as energy conservation, environmental protection, and the use of natural gas for electricity generation are confronted by both gas and electricity suppliers. Both the consumer and the energy suppliers are likely to benefit from a coordinated energy policy. Better cooperation by the different energy suppliers is also desirable. This can be accomplished by establishing an energy management body within the Government structure, e.g. the Energy Commission.
- 9.2** The Energy Commission to be established will become an umbrella organization to coordinate, monitor and regulate the energy industry and advise the Government on energy policy, covering such broad issues as energy supply, equipment supply, safety, pricing and trade practices.
- 9.3** Moreover, if the Government decides to pursue the common carrier system, the Energy Commission could offer strong support and co-ordination required for its eventual implementation.
- 9.4** With the two electricity companies already subjected to regulatory control, inclusion of gas under the Energy Commission would further ensure a coordinated and consistent energy policy.
- 9.5** The need for an umbrella organization is echoed at the consumer end. With electricity water heating and gas water heating being possible substitutes for each other, consumers would benefit from an energy policy which facilitate their right to switch between energy suppliers without excessive cost or practical difficulty.
- 9.6** The Energy Commission will be in a position to balance the interests of the various parties: HKCG, CLP, HKE, LPG suppliers and consumers. Clearly, this role exceeds that of the Gas Standards Office with scope beyond technical focus and expands into areas such as energy supply and tariff setting. This recommendation seeks to expand the operation of the Financial Monitoring Units under the ESB to provide it with a more visible role in the eyes of the public and the regulated industries.
- 9.7** Resources for the Commission could be obtained by pooling expertise from the Gas Standards Office and the Economic Services Branch. The funding required to support such an operation is thus expected to be minimal. The Commission should benefit from public participation and enhanced transparency.

X. CONCLUSION AND RECOMMENDATIONS

- 10.1 Towngas is a public utility providing the population with an important source of energy for water heating and cooking. Its importance to the livelihood of the community is significant. This is clearly illustrated by the fact that it has over 80% share of the piped gas market (piped LPG and Towngas). With continuous improvement in the standard of living and more consumers demanding the convenience of a central supply of energy fuels, the importance of Towngas to the community will only increase. Further, neither LPG nor electricity are practical close substitutes, particularly given the technical, legal and cultural barriers. Finally, with a fully developed distribution network, challenge from market entrants at this stage is unlikely to happen.
- 10.2 In the absence of effective competition, HKCG has been extremely successful due to the foresight and effective operation of the company. Profit margin of the company increased from 27.8% to 69.2% from 1985 to 1994. In theory, a monopoly will be in a position to obtain "super-normal profits", jeopardizing consumer interests and it is essential for the Government to closely monitor the market on public interest grounds.
- 10.3 As HKCG is becoming a natural monopoly, the time has come for Hong Kong to review its policy over the energy supply market. Consumer interests must be balanced with that of the company.
- 10.4 As a utility, HKCG is unique. It is the only major utility in Hong Kong which is not regulated (except for safety requirements). Until 1992, HKCG was listed as one of the scheduled bodies in the Consumer Council Ordinance, along side with HKE and CLP. As a result, HKCG was excluded from the purview of the Consumer Council's activities. Yet, unlike other scheduled bodies, HKCG is not under Scheme of Control nor does it operate under a franchise or license. This anomaly has since been removed from the Consumer Council Ordinance in 1992 with the entire Schedule deleted in 1994.
- 10.5 To safeguard consumer interest, the Consumer Council has proposed certain measures to be adopted by the Government. The motive is not anti-business and in no way jealous of profits made by businessmen for rewarding their efficiencies and risk bearing. The intention is not to penalise success, but to strike a balance between business interest and consumer interest, and to work toward a win-win situation for both the consumers and HKCG. The Consumer Council has given serious thought to the recommendations put forward and believes that their implementation will be in the best interests of the public.

RECOMMENDATION 1: COMMON CARRIER

- 10.6 To induce competition, Government should take positive steps to devise a feasible scheme to open up the gas distribution network in the territory, i.e. the “common carrier” system.

Rationale

Competition can best be achieved with other gas suppliers using HKCG’s transmission network in the same way as new network operators can access Hong Kong Telecom’s network by paying an “access” charge. The U.S. experience has demonstrated a substantial fall in gas price to a competitive level. Likewise, Hong Kong’s consumers will benefit from a competitive gas price.

Implementation

- 10.7 It is important to emphasize that the same type of gas must be used in the common carrier system, since different types of gas cannot be transmitted in the same piping.
- 10.8 HKCG will need to separate its network operation with its supplier function. Experience of implementing the common carrier concept in the telecommunication industry in Hong Kong indicates that considerable attention must be given to the setting of a fair access charge for the use of existing transmission system built by HKCG. The Government should consult with HKCG to ensure that the company is compensated fairly for their investment. If a fair and equitable access charge cannot be reached between the new entrants and the network providers, arbitration by the authority may be necessary.

RECOMMENDATION 2: NATURAL GAS

- 10.9 The Government should encourage industry players to bring natural gas to Hong Kong .

Rationale

10.10 Natural gas is a lower cost, safer alternative and environmental friendly in the long run. This is necessary in light of the fact that both types of gaseous fuels currently in use have their drawbacks.

Implementation

10.11 Drawing on experience from the telecommunication industry locally and the gas industry elsewhere, the Government should initiate a study and consult with the industry on the detail of implementing a common carrier / natural gas scheme and ascertain the cost of conversion immediately.

10.12 The Government should institute a pilot project at newly developed districts, for example, at Lantau Island as soon as practical.

10.13 The Gas Standards Office is urged to look into safety standards relating to transportation and storage of natural gas as soon as possible, so that these essential installations will be in place before natural gas is introduced. The current gas pipeline network can then be switched to transport natural gas at the appropriate time.

RECOMMENDATION 3: REGULATORY CONTROL

10.14 In order to safeguard public interest before a "common carrier" regime becomes operational, HKCG should be subjected to a form of regulatory control which is fair and equitable to the consumer as well as the company (see para. 8.2 - 8.5).

Rationale

10.15 It is possible to devise a regulatory regime that

- a) encourage efficiency in operational terms and in terms of investment and innovation.
- b) does not impose excessive costs or burdens on either the taxpayer or the regulated industry.
- c) allows the specification of 'public interest' requirements which the industry must perform.

Implementation

- 10.16 A price-cap (CPI - X) approach (see paragraph 8.23 - 8.28 for explanation and illustration) is suggested for regulating the company's activity. This approach represents a most flexible and efficient regulatory option since a bureaucratic set up is not required to constantly monitor and evaluate the company's profit level. Once the price-cap is determined, reviews can be conducted only when evidence indicates the existence of such a need.
- 10.17 Incorporated in this approach are incentives for efficiency gains whilst consumers will be safeguarded from excessive pricing. Further, it will provide an incentive to HKCG to open up its network in order to end Government regulation as soon as possible.
- 10.18 Ideally, it would be preferable to reach an understanding with HKCG for early implementation of a form of regulatory control as in the case of the electricity companies. Any regulatory measures adopted must be *short-term* and encompass definite plans as to how competition can be achieved through natural gas and common carrier. Without Government guidance and intervention, HKCG is unlikely to have any incentive to convert to a common carrier system and subject itself to competition.

RECOMMENDATION 4: CHOICE OF ENERGY SOURCE FOR CONSUMERS

- 10.19 To provide real choice to consumers, the Government should encourage developers to consider including in new housing developments installations that would allow consumers to switch between energy sources, i.e. provide 3-phase electrical wiring as well as gas piping ready for the eventual choice of end-users. The Government might consider imposing a requirement through legislative or administrative means where necessary.

Rationale

10.20 The proposal enables the consumers to choose the energy source and equipments best suited their needs. The increase in cost for the 3-phase electrical installation amounting to approximately \$3,000 per flat is less than the average price of property per square foot. Moreover, it is unlikely that this amount is to be borne entirely by consumers as competitive pressure may initially force the electricity companies and developers to absorb some of the cost. The benefit to the end-user would be long term.

RECOMMENDATION 5: ENERGY COMMISSION

10.21 It is recommended that an Energy Commission³⁶ be established to coordinate, monitor and regulate the energy sector and advise on energy policy. Its authority would cover all issues concerning energy supply, equipment supply, safety, pricing and trade practices.

10.22 It is also suggested that an Energy Advisory Committee be formed with Government officials, industry experts, as well as members of the public. The role of this committee would be to advise the Energy Commission on issues of energy policy and would be similar to that of the Gas Safety Advisory Committee but with a greater level of responsibility. Participation by members of the public would be needed to enhance transparency and objectivity of decisions.

Rationale

10.23 Both the consumer and the energy suppliers are likely to benefit from a coordinated energy policy in future. The Commission will also benefit from public participation and enhanced transparency.

Implementation

10.24 Energy Commission can be formed by pooling expertise from the Gas Standards Office and Financial Monitoring Unit of the Economic Services Branch. The financial resources required to support such an operation is expected to be minimal.

³⁶ In the U.S., the Federal Energy Regulatory Commission was formed to perform this function.

OTHER RECOMMENDATIONS

Separate Pricing Controls

10.25 As regards pricing levels set by companies, specific items within energy charges for example, maintenance charges, should be subject to separate controls (for example, that they should rise no faster than the CPI itself). Such a provision would be useful in helping to ensure that the structure of tariffs, as well as their overall level, could be controlled.

Accounting Transparency and Separate Accounting

10.26 In order to facilitate effective monitoring and control of prices and charges, accounting transparency and separate accounting for gas sales services and non gas sales services should be introduced. A regime similar to that currently practiced by HKT in its domestic as opposed to international services could be adopted. Furthermore, such practice can pave the way for the eventual open access of the transmission network leading to a common carrier system.

Common Conduit

10.27 In a number of advanced countries, a common conduit system is planned for at new developments making it easier to access and maintain all utility carriers. It is understood this is a separate issue from the above. However, this is a useful concept for the Government to consider at the town planning stage.

Appendix 1: Economic Analysis on Substitutability

- A 1.1 Whether switching and substituting pose a practical and effective threat to the dominating company can be quantified using the economic concept of elasticity. Elasticity, η , measures demand responsiveness in terms of quantity consumed against price changes. Demand is said to be elastic if the absolute value of η is greater than 1. This indicates that for a given price increase (decrease), consumers will reduce (increase) quantity consumed to a larger extent. By the same token, an elasticity of less than 1 indicates that for a given price increase (decrease), consumers will reduce (increase) quantity consumed by a small degree. The former represents the fact that consumers have the ability to switch to alternatives if they find the price of a particular product unreasonable, hence a reduction in quantity consumed. The latter indicates that consumers' choice is limited, hence not much changes in quantity compared with price changes.
- A.1.2 The issue of elasticity was addressed in an earlier study by a group of Government senior staff for Towngas. In their study, the demand curve was graphically examined by plotting the time-series price-quantity combinations. The price figure used was the average price of Towngas for a given year deflated by inflation, while the quantity used was the total energy supplied by HKCG (expressed as million MJ) in a given year. A number of issues require clarification.
- A.1.3 First, from a pure economics perspective the demand function displays the relationship between price and quantity at a given point in time, thus it is not appropriate to estimate the demand curve using time series data. However, given the practical limitation of the lack of data, the use of time-series information to estimate the demand function is acceptable.
- A.1.4 When using a CPI adjusted price accurately, the study team accurately accounts for the 'real' impact of price on a consumer's consumption decision. However, the use of total quantity supplied is subject to question. To start with, the use of quantity supplied includes sales to commercial and industrial customers whose demand pattern is likely to differ from that of the consumer. Furthermore, such an approach did not take into account of the growth in the customer base from year to year.

A.1.5 A more appropriate estimate would be first to calculate the consumer's share of the total consumption and divide the resulting figures by the estimated number of households. One limitation with such an approach is that the actual number of households is not available. To get around the problem, we assumed that the rate of growth of a household is the same as the rate of growth of the rest of HKCG's customer base and used the average number of meters as a proxy of the number of active customers. These adjustments are reported in table A1.

Table A1 - Price and Quantity Demand for Towngas

Year	Inflation Adjusted Price Index	Total Consumption (k MJ)	% Domestic Consumption	Average meters installed (000)	Quantity Consumption per household (MJ per household)
1986	84.1	9.04	42	442.1	8,594
1987	90.3	10.6	42	510.5	8,707
1988	85.6	12.2	42	580.3	8,865
1989	81.2	13.6	42	653.1	8,792
1990	82.9	15.1	42	724.2	8,732
1991	82.5	16.2	43	794.2	8,791
1992	76.8	18.2	43	864.4	9,058
1993	74.1	19.1	43	934.9	8,830
1994	71.1	20.7	43	1,005.4	8,864

A.1.6 Given the above adjustment, table A2 reports the re-estimated elasticity figures for Towngas. As can be seen from the last column of the table, other than the year 1991, all elasticity estimates indicate that the demand for Towngas is less 1. This evidence is consistent with the view that the consumer of Towngas does not possess great ability to switch in response to price changes.

A.1.7 Our result indicates an inelastic demand curve, rather than the conclusion offered by the study team suggesting that "the price of town gas is very elastic to the quantity used by the market. It implies that the price of Towngas is adjusted by the market and the absence of monopoly power..." On the contrary, the evidence here provides support for the earlier view that electricity and LPG are not close substitutes for Towngas with consumers having limited ability to switch in response to price changes.

Table A2 - Elasticity Estimates for Towngas

Year	<i>Inflation Adjusted Price Index</i>	<i>Quantity Consumption per household (MJ per household)</i>	Degree of Change in Price	Degree of Change in Quantity	Elasticity
1986	84.1	8,594			
1987	90.3	8,707	0.074	0.013	0.177
1988	85.6	8,865	0.055	0.018	0.330
1989	81.2	8,792	.054	0.008	0.152
1990	82.9	8,732	0.021	0.007	0.329
1991	82.5	8,791	0.005	0.007	1.384
1992	76.8	9,058	0.074	0.030	0.409
1993	74.1	8,830	0.036	0.026	0.706
1994	71.1	8,864	0.042	0.004	0.091

Appendix 2:

Table 1 - Gas Consumption by Energy Content

Year	Cylinder LPG		Piped (Bulk) LPG		Towngas	
	Terajoule	Market Share (%)	Terajoule	Market Share (%)	Terajoule	Market Share (%)
1981	4,839	49.5	912	9.3	4,034	41.2
1986	6,800	40.5	1,044	6.2	9,043	53.3
1991	8,006	30.4	2,076	7.9	16,238	61.7
1993*	7,870	27.0	2,041	7.0	19,198	66.0

Source: Caltex Oil Hong Kong

Note: * 1993 estimate obtained from *Hong Kong 1994*

Appendix 3:

Table 2 - Market Share of LPG Suppliers (1994).

Company	Cylinder LPG (%)	Bulk LPG (%)
Caltex	19	8
CRC	12	N/A
Esso	13	21
Mobil	27	23
Shell	29	48

Source: Caltex Oil Hong Kong

Note: CRC is not in the bulk LPG market.

Appendix 4:

Table 3 - Number of Households Piped for Central Gas Supply

	1988	1989	1990	1991	1992
<u>Private Housing</u>					
Number of Units Piped					
HKCG	370,518	401,049	423,920	456,920	483,522
LPG	48,318	49,546	50,697	53,560	56,360
Percent Market Share (%)					
HKCG	88.5	88.0	89.3	89.5	89.6
LPG	11.5	11.0	10.7	10.5	10.4
<u>Housing Authority</u>					
Number of Units Piped					
HKCG	421,676	454,279	501,884	544,486	567,395
LPG	127,003	128,437	132,171	128,779	128,779
Percent Market Share (%)					
HKCG	76.9	78.0	79.2	80.9	81.5
LPG	23.1	22.0	20.8	19.1	18.5
<u>Housing Society</u>					
Number of Units Piped					
HKCG	18,511	18,908	19,417	20,831	21,107
LPG	9,537	11,260	11,952	15,388	15,388
Percent Market Share (%)					
HKCG	66.0	32.7	61.9	57.5	57.8
LPG	34.0	37.3	38.1	42.5	42.2
<u>Total Market</u>					
Number of Units Piped					
HKCG	810,705	874,236	945,221	1,022,237	1,072,561
LPG	184,858	189,273	194,820	197,727	200,527
Percent Market Share (%)					
HKCG	81.4	82.2	82.9	83.8	84.2
LPG	18.6	17.8	17.1	16.2	15.8

Source : The Hong Kong and China Gas Company, Ltd.

(as reported in the Hong Kong Economic Journal 8/21/1993)

Note : Total market share calculated by Consumer Council

Appendix 5:

Table 4 - Energy Consumption for Water Heating and Cooking

	CLP estimates (%) [*]	HKCG estimates (%)
Electricity	23.5	30.0
Towngas	51.4	40.0
LPG ^{**}	25.1	30.0

Source: CLP and HKCG

Note : * applicable only to CLP service area.

** LPG figures include piped and cylinder LPG.

Appendix 6:

Table 5 - CPI(A) and Gas Price Index

Year	CPI Adjustment	CPI Adjusted Gas Price Index
1985	100.0	100.0
1986	102.8	84.1
1987	108.4	90.3
1988	116.5	85.6
1989	128.2	81.2
1990	140.7	82.9
1991	157.7	82.5
1992	171.1	76.8
1993	184.9	74.1
1994	200.4	71.1

Source : The Hong Kong and China Gas Company, Ltd.

Census and Statistics Department

CPI adjusted gas price index compiled by the Council.

Appendix 7:

Table 6 - Historical movements of Naphtha and Towngas

Year	Annual Percentage Change (Naphtha)	Inflation adjusted Naphtha prices (%)	Annual Percentage Change (Towngas)	Inflation adjusted Towngas prices (%)
1985	N/A	100	N/A	100
1986	-34.5	63.8	-15.7	84.1
1987	6.8	64.6	11.7	90.3
1988	-7.3	55.7	1.9	85.6
1989	-0.9	50.2	4.2	81.2
1990	21.6	55.6	10.8	82.9
1991	20.4	59.7	10.4	82.5
1992	-15.5	46.5	0.9	76.8
1993	-9.6	38.9	4.1	74.1
1994	-10.2	32.3	3.8	71.1

Source: The Hong Kong and China Gas Company, Ltd.

Appendix 8:

Table 7 - Estimated unit operating cost of HKCG

Year	Average Unit Operating Cost (\$)	Annual Percentage Change (%)	CPI adjusted unit cost
1985	0.0779	N/A	N/A
1986	0.0627	-19.6	78.3
1987	0.0727	15.9	86.0
1988	0.0701	-3.5	77.2
1989	0.0716	2.1	71.6
1990	0.0815	13.8	74.3
1991	0.0906	11.2	73.7
1992	0.0874	-3.6	65.5
1993	0.0904	3.4	62.7
1994	0.0880	-2.6	56.3
Total percentage change		13.0	

Source : The Hong Kong and China Gas Company, Ltd.

Census and Statistics Department

Average unit operating cost and CPI adjusted index compiled by the Council.

Appendix 9:

Table 8 - Implied Impact of Cost on Price Changes.

Year	Cost as a percentage of Unit Revenue (%) ¹	Annual Cost Change (%)	Implied Impact of Cost on Price (%) ²	Actual Price Change (%)	Excess Increase (Actual - Implied)	Estimated Annual Dollar Excess (\$ 000) ³
1985	78.2	N/A	N/A	N/A	N/A	N/A
1986	72.6	-19.6	-14.2	-13.6	0.63	2,619
1987	72.5	15.9	11.5	13.2	1.69	9,312
1988	68.6	-3.5	-2.4	1.9	4.33	27,774
1989	67.3	2.1	1.4	4.3	2.93	22,389
1990	68.0	13.8	9.4	12.1	2.73	25,505
1991	67.6	11.2	7.6	11.6	3.96	45,125
1992	64.0	-3.6	-2.3	0.9	3.23	41,136
1993	63.4	3.4	2.2	4.3	2.15	30,134
1994	59.1	-2.6	-1.5	3.9	5.45	87,153

Source: The Hong Kong and China Gas Company, Ltd.

Census and Statistics Department

Average unit operating cost and CPI adjusted index compiled by the Council.

- Note:
1. Cost percentages are estimated by dividing unit operating cost by unit price.
 2. Implied Impact of Cost on Price is calculated by multiplying (2) and (3).
 3. Estimated Annual Dollar Excess is estimated from

Excess Increase x Percent of Revenue from Domestic Gas Sales x Total Revenue.

Appendix 10:

**Table 9 - Price changes between Towngas, LPG and electricity
(1985 - 1994)**

Year	HKCG (%)	LPG (%)	HKE (%)	CLP (%)
1985	N/A	N/A	N/A	N/A
1986	-13.6	-8.7	-3.7	-6.3
1987	13.2	1.1	-2.8	-3.4
1988	1.9	3.7	-0.4	3.2
1989	4.3	3.1	4.3	0.0
1990	12.1	16.9	8.2	3.4
1991	11.6	8.5	6.8	3.3
1992	0.9	15.0	5.0	3.0
1993	4.3	3.8	4.1	3.6
1994	3.9	7.6	4.7	5.7*
Total	42.4	60.7	28.7	12.4

Source: Various Companies

Note : Percentage change figures calculated by Consumer Council

* excluded a special rebate for the year that effectively reduced the per cent increase to 3.1%. The total price change will be 9.7%.

Appendix 11:

Table 10 - Minimum charges of selected utilities (1993)

Company	Monthly Maintenance Fee	Monthly Minimum Usage Charge	Total Monthly (or equivalent) Charge	Total Annual (or equivalent) Charge
HKCG	\$7	\$12	\$19	\$228
Caltex Oil	\$5-\$7 (Optional)	\$7	\$12-\$14	\$144-\$168
Shell	\$6	\$18	\$24	\$288
CLP	N/A	\$12	\$12	\$144
HK Electric	N/A	\$7.74	\$7.74	\$92.88
HK Telecom	N/A	N/A	N/A	\$744

Source: Various Companies

Appendix 12: Discussion on Maintenance Charges

A.12.1 HKCG responded that the service is important in order to ensure equipment safety and the increase rates are necessary to bring the “money-losing” maintenance business into the “black”. The \$83.5 million maintenance charge collected in 1994 was used to support 799,181 customer calls for service through the Customer Service Hotline. Of the service calls, 66% required visits, 12% of which needed follow-up visits. In all, the company estimated that the cost per visit amounted to \$133. Based on HKCG’s costing figures, the visits alone amounted to \$78.5 million. The difference of 5 million is assumed to be for expenses other than visits. HKCG’s annual report does not contain accounting information on this function. Given the concern expressed, this Council considers disclosure of such information desirable to enhance the public’s understanding of the company’s operation in this area.

A.12.2 Publications by HKCG indicate that the monthly service charge covers :

- a) labour for appliance maintenance and repair,
- b) on-demand appliance check-ups, and
- c) safety inspection for appliances.

Excluded from the service are:

- a) replacement parts for appliances,
- b) replacement of rubber hose for hotplates,
- c) material and labour for repair or replacement of internal gas piping,
- d) repair or replacement of external gas piping (service riser), and
- e) appliance disconnection and reconnection.

A.12.3 As suggested in the list, only appliance-related maintenance in a household is covered in the maintenance charge levied. Gas piping and rubber hose external to appliances are not included in this scheme. Hence, this compulsory charge is not unlike most optional maintenance contracts offered by electrical and electronic equipment suppliers. The exclusion of piping and hoses external to appliances in the maintenance scheme raises concern over safety. At issue is whether the consumer will avoid and delay repairs of hose and piping until the situation becomes critical.

Appendix 13:

Table 11 - Monthly Maintenance Charge by HKCG

Year	Monthly Charge (HK \$)	Annual Percentage Increase of Charge (%)	Average Number of Meters Installed ¹	Actual Revenue Received (\$ Mil.) ²	Annual Percentage Increase of Revenue (%)
1986	3	0.0	442,133	14.5	15.1
1987	3	0.0	510,556	17.0	17.4
1988	3	0.0	580,257	19.5	14.7
1989	3	0.0	653,047	21.9	12.1
1990	4	33.0	724,161	32.5	48.7
1991	5	25.0	794,227	45.6	40.4
1992	6	20.0	864,364	60.0	31.5
1993	7	16.0	934,850	74.6	24.3
1994	7.5	7.1	1,005,430	83.5	12.0

Source : The Hong Kong and China Gas Company, Ltd., Annual Report.

Note : 1. Average number of meters installed is calculated by finding the average between number of meters installed at the beginning of year and the number of meters at year end.

2. Total revenue is estimated by multiplying the annualised charge by the average number of meters installed.

Appendix 14:

Table 12 - Installation Charges by Various Companies

Companies	Charges(HK \$)
HKCG	190
Caltex	80-120
Shell	Free (refundable deposit of \$200 - \$300)
Hongkong Electric	N/C
China Light and Power	N/C
Hongkong Telecom	600

Source: Various Companies

Appendix 15:

Table 13 - Equipment sales by HKCG.

Year	Equipment Sales as a Percent of Total Revenue (%)	Estimated Revenue from Equipment Sales (\$ mil.)	Annual Growth Rate (%)
1985	15	149.07	N/A
1986	17	168.05	-12.7
1987	17	222.53	32.4
1988	16	244.14	9.7
1989	17	308.81	26.5
1990	16	356.18	15.3
1991	15	398.06	11.8
1992	13	384.87	-3.3
1993	13	423.75	10.1
1994	14	520.58	22.9
Total Growth (%)			15.3%

Source: HKCG Annual Report - Various Issues

Appendix 16: Towngas Service Pledge 1994

a) Reliability

- uninterrupted gas supply (99.97%)
- restoration of gas supply within 24 hours (99.46%)

b) Safety

- Emergency Units arrived on site within an hour (99.79%)

c) Appointments

- availability within 3 working days (100%)
- keeping appointments (92%)

d) Service Attitude

- courteous and friendly (scored 7.86 out of 10)

e) Speed and Convenience

- Customer Service Hotline
 - ⇒ Call answered within 5 rings (97.91%)
 - ⇒ Less than 1 minute to get access to staff (86.43%)

Appendix 17:

Table 14 - Corporate Growth Measures of Various Companies

Year	CLP		HKE		HKCG		
	Asset Growth (%)	Sales Growth (%)	Asset Growth (%)	Sales Growth (%)	Asset Growth (%)		Sales Growth (%)
					as reported with land revaluation	adjusted for land revaluation	
1985	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1986	13.2	9.5	18.2	10.2	28.2	28.2	-0.5
1987	7.1	10.9	7.8	14.8	11.6	11.6	32.4
1988	2.8	6.5	13.8	11.2	12.0	12.0	16.6
1989	6.7	9.9	15.8	7.3	24.7	24.7	19.0
1990	8.1	7.5	14.1	11.5	32.7	32.7	22.5
1991	10.4	11.1	13.0	12.6	17.7	17.7	19.2
1992	6.3	14.1	12.4	11.0	13.6	13.6	11.6
1993	13.7	10.5	13.9	12.3	110.4	31.7	10.1
1994	12.0	2.3	16.5	12.5	10.3	16.5	14.1
Total	214.5	130.0	322.3	147.6	822.5	543.6	374.2
Average	8.9	9.0	13.9	10.6	29.0	21.0	16.1

Source: Annual reports, various companies.

Market return and SOC return figures calculated by Consumer Council

Notes: growth rates are estimated based on total assets.

* total assets for HKCG are calculated with "Net Working Capital" included. This is different from the total assets figure reported by the company.

** asset growth figure for HKCG is significantly higher in this year as a result of upward revaluation of land value.

Appendix 18:

Table 15 - Revenue and Profitability growth by HKCG

Year	Revenue (HK \$, mil.)	Net Income After Tax (HK \$, mil.)	After Tax Margin on Sales ¹ (%)	Operating Margin on Gas Sales ² (%)
1985	\$993.8	\$184.8	18.6	27.8
1986	\$998.5	\$235.2	23.5	37.7
1987	\$1,309.0	\$320.7	24.5	37.9
1988	\$1,525.9	\$423.9	27.8	45.7
1989	\$1,816.5	\$534.8	29.4	48.5
1990	\$2,226.1	\$648.2	29.1	47.0
1991	\$2,653.7	\$778.7	29.3	47.9
1992	\$2,960.5	\$936.1	31.6	56.3
1993	\$3,259.6	\$1,135.6	34.8	57.8
1994	\$3,718.4	\$1,367.9	36.8	69.2
Average annual growth (1985- 1994)	14.1	22.2		

Source : Hong Kong and China Gas Co., Ltd., Annual Report

Profit margins calculated by Consumer Council

- Notes: 1. After tax profit margin is estimated by dividing net income with revenue.
2. Operating Margin on Gas Sales is estimated by dividing unit operating income (Net income plus interest and taxes) by estimated unit operating cost (revenue minus operating income) for gas sales only.

Appendix 19:

Table 16 - Revenue and Profitability growth by CLP and HKE

Year	Revenue (HK \$, mil.)		Net Income After Tax (HK \$, mil.)		After Tax Profit Margin ¹ (%)	
	CLP	HKE	CLP	HKE	CLP	HKE
1985	\$6,800	\$2,624	\$1,270	\$969	18.7	36.9
1986	\$7,447	\$2,891	\$1,474	\$1,130	19.8	39.1
1987	\$8,259	\$3,318	\$1,672	\$1,263	20.2	38.1
1988	\$8,796	\$3,690	\$1,828	\$1,464	20.8	39.7
1989	\$9,666	\$3,961	\$2,017	\$1,791	20.9	45.2
1990	\$10,389	\$4,415	\$2,322	\$1,777	22.4	40.2
1991	\$11,545	\$4,970	\$2,848	\$2,195	24.7	44.2
1992	\$13,169	\$5,517	\$3,173	\$2,377	24.1	43.1
1993	\$14,547	\$6,197	\$3,552	\$2,745	24.4	44.3
1994	\$14,881	\$6,974	\$4,206	\$3,475	28.2	49.8
Average annual growth (1984-1993)	9.1	11.5	10.8	15.1		

Source : Annual Report, various companies

Profit margins calculated by Consumer Council

Notes:

1. After tax profit margin is estimated by dividing total net income by total revenue. No S.O.C. adjustments are accounted for here since development funds are charged after Net income after tax is calculated.
2. Operating Margin on Gas Sales is estimated by dividing unit operating income (Net income plus interest and taxes) by estimated unit operating cost (revenue minus operating income) for gas sales only.

Appendix 20:

Table 17 - Return on Asset Analysis

Year	CLP			HKE			HKCG	
	Market return on Total Assets (%)	SOC return on Total Assets (%)	Fixed Asset Growth Rate (%)	Market return on Total Assets (%)	SOC return on Total Assets (%)	Fixed Asset Growth Rate (%)	Return on Total Assets (%)	Fixed Asset Growth Rate (%)
1985	9.1	8.6	N/A	11.2	9.8	N/A	11.7	N/A
1986	10.8	9.1	13.1	11.2	9.6	19.4	11.6	27.3
1987	11.8	9.8	6.9	10.9	10.1	7.8	14.1	10.1
1988	12.0	10.5	3.9	12.4	11.3	13.1	16.7	10.4
1989	12.0	10.6	5.7	11.9	10.7	15.8	16.9	15.0
1990	12.5	10.9	8.8	12.1	10.7	14.3	15.4	36.4
1991	11.5	11.1	10.5	12.1	10.8	14.0	15.7	23.1
1992	12.4	11.4	5.6	12.3	10.9	12.9	16.7	14.8
1993	12.6	11.0	12.8	12.2	11.0	13.8	9.6	102.4 ^{***}
1994	10.2	11.3	13.8	12.1	10.8	18.2	10.5	4.9 ^{***}
Average	11.8	10.6	9.5	11.9	10.7	14.3	14.1	30.4

Source : Annual reports, various companies.

Market return and SOC return figures calculated by Consumer Council

Notes:

* growth rates are estimated based on fixed assets.

** return on asset figures for HKCG in these years are significantly lower as a result of upward revaluation of assets. The comparable figures without the revaluation are 15.4% and 15.9% for 1993 and 1994, respectively. The average ROA will be 16.0% instead of 14.1% after adjusting for the effect of revaluation.

*** Fixed asset growth rates for these years are significantly higher as a result of upward Evaluation of assets. The comparable figures without the revaluation are 9.0% and 9.2%, respectively for 1993 and 1994. The average growth rate for fixed assets will be 21.5% instead of 30.4% after taking account of the revaluation.

Appendix 21:

Table 18 - Return on Equity Analysis

Year	CLP			HKE			HKCG	
	Market return (%)	SOC return (%)	Equity Growth Rate (%)	Market return (%)	SOC return (%)	Equity Growth Rate (%)	return on Equity (%)	Equity Growth Rate (%)
1985	29.3	27.8	8.6	28.5	25.1	10.5	16.9	70.0
1986	30.1	25.4	30.8	30.4	26.1	11.3	18.4	16.7
1987	30.0	25.0	17.1	28.8	26.7	10.6	22.5	11.8
1988	27.5	24.0	14.3	33.1	30.2	12.4	25.7	15.4
1989	26.4	23.3	11.2	32.9	29.6	12.3	27.6	17.6
1990	26.9	23.6	10.4	23.9	21.1	59.5	28.3	18.2
1991	24.9	24.0	10.1	24.7	22.1	9.0	28.7	18.3
1992	26.1	23.9	9.2	25.9	23.0	9.4	29.2	18.2
1993	27.9	24.5	7.8	26.7	23.9	9.8	13.2**	169.6***
1994	23.2	25.7	8.7	27.9	24.9	10.3	13.4**	18.5***
Average	27.5	24.6		28.0	25.1		22.4	

Source: Annual reports, various companies.

Non SOC figures calculated by Consumer Council

Notes:

** return on equity figures for HKCG in these years are significantly lower as a result of upward increase in equity reserve as a result of land revaluation. The comparable figures without the revaluation are 26.9% and 23.5% for 1993 and 1994, respectively. The average ROE will be 24.8% after adjusting for the effect of revaluation.

*** Equity growth rates for these years are significantly higher as a result of upward evaluation of land. The comparable figures without the revaluation are 31.6% and 38.0%, respectively for 1993 and 1994.

Appendix 22:

Table 19 - Capital Structure Analysis

Year	CLP		HKE		HKCG
	Debt Equity Ratio (with Development Fund) (%)	Debt Equity Ratio (without Development Fund) (%)	Debt Equity Ratio (with Development Fund) (%)	Debt Equity Ratio (with Development Fund) (%)	Debt Equity Ratio (%)
1985	176.5	168.1	109.4	99.8	26.5
1986	133.0	121.9	97.0	87.4	29.5
1987	113.6	99.1	120.1	108.7	30.5
1988	95.5	79.3	115.6	105.9	26.8
1989	82.0	64.3	127.7	116.3	35.2
1990	80.6	61.3	52.8	47.4	49.1
1991	76.5	58.1	64.7	59.2	54.2
1992	73.3	54.3	63.8	59.6	41.1
1993	78.9	57.8	65.0	61.4	12.7
1994	79.6	64.7	74.4	68.7	7.3

Source: Annual reports, various companies.

Figures calculated by Consumer Council

Appendix 23:

Table 20 - Return Comparison against LPG Parent Companies

Company	Profits as % of Revenue (1994)	Profits as % of Assets (1994)	Return on Equity (1984-1994)
HKCG	36	12	23
Exxon	5	6	16
Mobil	2	3	18
Texaco	3	4	14

Source : HKCG, Annual Reports

Fortune, May 1995

Appendix 24:

**Table 21 - Profitability Comparative of public utilities of other countries
1992.**

	Return on	
	Asset (%)	Equity (%)
<i>Selected</i>		
<i>American Utilities (Average)</i>	4.4	12.2
Pacific Gas & Electric	4.5	12.0
Philadelphia Electric	4.3	12.4
<i>Selected</i>		
<i>Canadian Utilities (Average)</i>	1.1	5.7
Hydro Quebec	1.8	8.2
Ontario Hydro	0.5	3.1
<i>Selected</i>		
<i>European Utilities (Average)</i>	1.9	6.7
Electric De France	0.2	8.4
British Gas	3.5	4.9
<i>Selected</i>		
<i>Japanese Utilities (Average)</i>	1.6	6.5
Tokyo Electric Power	0.7	5.4
Chubu Electric Power	1.3	7.0
Kyushu Electric Power	1.2	7.3
<i>Selected World Average</i>	2.0	7.6
HKCG	21.1	31.7

Source: Project Report, Senior Staff Course

Note: Averages calculated by Consumer Council

Appendix 25:

Table 22 - Return Comparison against U.S. Electric and Gas Companies

Company	Profits as % of Revenue (1994)	Profits as % of Assets (1994)	Return on Equity (1984-1994)
Pacific Gas & Electric	10	4	12
SCECORP	9	3	10
Southern	12	4	17
Unicom	6	2	7
Consol. Edison of N.Y.	12	5	13
Average U.S.	9.8	3.6	11.8
HKCG	36.8	14.1	22.4

Source : HKCG, Annual Reports

Fortune, May 1995

Appendix 26:

Table 23 - Average Market Return vs. Average Market Cost of Equity by Selected Utilities (1992-1994)

Companies		Average Stock Market Return (%) 1993	Market Cost of Equity (%) 1993	Return in excess of Cost (%)
HKCG		23.7	22.4	1.3
CLP	Market Return	26.3	22.8	3.5
	SOC return	24.1		1.3
HKE	Market Return	25.7	23.7	2.0
	SOC return	23.0		-0.7
HKT		46.7	25.2	21.4

Source: 1993 Annual Reports, various companies.

Hong Kong Economic Journal, 1992-1994

HSI Services Limited.

Excess return calculated by Consumer Council.

Note:

* Average Return figures are average annual return 1992 - 1994.

** The average return is 28.3% if the extraordinary item of "Property Revaluation Reserve" of \$4,420.8 million is excluded, the associated excess over cost of equity return is 5.8%.

Appendix 27:

Table 24 - Average Gas Prices of Selected Countries (1993)

Country	Gas Supply	Price (HK cent/MJ)
Hong Kong	Towngas	14.2
Australia	natural gas	5.1
Canada	natural gas	3.3
Japan	LNG/LPG	22.2
Korea	LNG/LPG-Air	5.4
Singapore	Towngas/natural gas	12.9
Taiwan	LNG/LPG	13.6
U.K.	natural gas	5.2
U.S.	natural gas	4.4

Source: HKCG



家用熱水及煮食燃料 市場競爭研究報告

1995年7月
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(一) 簡介

為配合港督彭定康先生於一九九二年十月發表的施政報告，消費者委員會進行了一系列研究，探討市場競爭情況及其對消費者的影響。研究範圍其中包括熱水及煮食燃料供應市場。

- 1.2 熱水及煮食燃料對香港市民來說，是日常必需品，因此消委會對這市場中的經營手法及競爭展開了研究，探討其對消費者利益的影響。是項研究由消委會的督導小組領導消委會研究人員進行。督導小組成員包括：

主席：陳坤耀教授
委員：趙培剛先生
何秩生博士
羅祥國博士
廖秀冬博士
文暮良先生
吳崇文醫生
胡紅玉女士

- 1.3 消委會曾就是項研究聽取下列海外機構及專家的意見：

英國煤氣公司
英國氣體燃料消費者委員會
英國氣體供應事務處
澳洲新南威爾省氣體燃料監管局成員 Elizabeth Morley 女士
英國研究顧問 John Winward 先生

- 1.4 消委會謹向下列會對這項研究提供協助的機構致謝：

中華電力有限公司
加德士石油公司
布政司署經濟科
埃索石油公司
氣體標準事務處
香港中華煤氣有限公司
香港電燈公司
香港房屋委員會
香港房屋協會
無比石油公司
新世界發展有限公司
蜆殼石油公司
新鴻基地產發展有限公司

研究目的

- 1.5 研究旨在研究家用熱水及煮食燃料供應業內的競爭情況及供應商的經營手法，對消費者利益的影響。報告亦對市場環境作出分析，這包括有關市場運作的法律及管制、市場結構及集中程度、市場行為及供應商表現及業績。根據研究結果，消委會就加強市場競爭提出多項建議。
- 1.6 香港中華煤氣有限公司(以下簡稱煤氣公司)是熱水及煮食燃料的主要供應商。該公司並非專利經營公司，如巴士公司，也不是受政府「管制計劃」的公司。由於該公司以供應煤氣作為其主要業務，因此在這份研究報告中，無可避免地會較多以該公司及其產品作為分析對象。報告無意對煤氣公司作出任何針對性的市場行為調查。

(二) 研究結果簡介

- 2.1 由於石油氣、煤氣及電力，各有其特性和獨特的輸送網絡及管制條例，三者並非是完全代替品。
- 2.2 由於法例規定石油氣的輸送管不能在公共道路下敷設，限制了石油氣在住宅樓宇的供應，令石油氣公司難以有效地在市場上和其他對手競爭。
- 2.3 電力和煤氣之間的競爭對消費者的利益並不明顯。部份原因是中國人喜歡明火煮食的習慣；此外，由於每種能源只有一間供應商，競爭程度大大減低。在電力供應方面，消費者根據其居住地點，只能有一個選擇——中華電力公司或香港電燈公司。在氣體燃料方面，煤氣公司是唯一的供應商。
- 2.4 發展商決定在新樓選用何種能源，消費者並沒有機會參與決定，雖然在理論上，住戶可轉換其能源供應，但仍然受到法律、技術及傳統習慣的限制。這種限制讓煤氣公司得到競爭上的優勢，成為市場的領先者。

市場佔有率

- 2.5 煤氣公司在氣體燃料市場上佔有率最高，1993年為66%。管道石油氣的佔有率最低7%，而罐裝石油氣佔27%。
- 2.6 在設有管道的燃料市場中，全港八成的住宅設有煤氣，接近九成私人樓宇有煤氣供應。

價格

2.7 研究發現：

- a) 自一九八五年以來，煤氣價格增幅較消費物價指數的增幅為低。一九九四年煤氣經通脹調整價格是一九八五年價格的 71%，但是
- b) 煤氣價格的增幅高於成本增幅。
 - 石腦油(煤氣的主要原料)價格的增幅：在刪除通脹的調整後，1994 年的價格與 85 年比較，增幅只是 32.3%。
 - 過去十年每單位經營成本，經通脹調整後，增幅只是一九八五年的 56.3%。
- c) 同期煤氣價格的增幅為 42%，較電力為高(中電 12.4%，港燈 28.7%)。

業績表現

- 2.8 過去十年間(一九八五年至一九九四年)，煤氣公司的資產總值增加了 822.5%，銷售量增加了 374.2%。
- 2.9 中電、港燈和煤氣公司十年間的平均資產回報率分別為 11.8%、11.9% 及 14.1%(若按重估土地價值調整後則為 16%，中電、港燈的數據以假設沒有管制計劃的回報率計算)。
- 2.10 與美國五大電力及煤氣公司平均回報率比較，這些屬於世界上盈利最高的公司，在過去十年間(一九八五年至一九九四年)的資產回報率和股東利潤率分別為 3.6%和 11.8%。煤氣公司同期在這兩方面的回報率分別為 14.1%和 22.4%。

(熱水及煮食燃料市場競爭研究報告)

結論及建議

由於缺乏有效的市場競爭，香港煤氣公司在家用熱水及煮食燃料供應市場佔了優勢。在其他競爭者面對各樣限制的情況下，煤氣公司的市場佔有率將繼續擴大。在這種情形下，煤氣公司成功地取得盈利佳績，公司藉著龐大的市場力量，偏高的收費水平有待商榷。

隨著香港近年的社會經濟發展，新的屋邨代替了舊式樓宇，改變了氣體燃料供應商之間的競爭，因此，香港有需要重新評估整體市場的競爭情況。事實上，煤氣公司經已發展成為「具壟斷優勢的公用事業」，且是唯一尚沒有受政府監管的公用事業(氣體安全的監察除外)。

作為公用事業機構，煤氣公司的情況是非常特殊的。一向以來，煤氣公司和其他公用事業公司都是「消費者委員會條例」附表上列明在消費者委員會工作範圍以外的公司，但煤氣公司卻是表列上唯一既不受政府監管的公司、也不是向政府取得特許經營權和牌照的公司。政府其後于 1992 年修改法例的附表，使消費者委員會可以處理和煤氣公司有關的消費事務，而政府終於 1994 年完全刪除該表。

為保障消費者利益，消費者委員會向政府提出以下建議，出發點絕非妬忌或懲罰經營成功的商業機構，而是確保政府對所有公用事業機構一視同仁，包括煤氣公司在內，同時對消費者要公平。消費者委員會的建議是經過深思熟慮的，深信建議的實施，符合最佳公眾利益。

建議一

為促進氣體燃料供應市場的競爭，政府應積極制訂可行的計劃，開放氣體供應網絡，即所謂「共同輸送」系統，使其他供應商可以通過共同網絡，把同品質的氣體輸送給客戶，形式正如剛開放的電訊網絡一樣。好處在於締造市場競爭，減輕政府監管的負擔。

英國已決定開放氣體供應網絡，並積極籌備實施細則。美國自從一九八五年以來，經已開放網絡。美國的氣體供應市場自從撤銷監管，引進競爭後，氣體燃料價格大幅下降，達至競爭的水平。一旦本港的氣體燃料在價格方面出現競爭，消費者自然獲益。

建議二

政府應鼓勵經營者把天然氣體引入本港。現時在本港應用的兩類氣體燃料均有缺點，有需要引入天然氣。長遠來說，天然氣的價錢較低廉在使用上亦較為安全(不含有毒物質)。消委會建議政府在新發展區，例如在大嶼山，先行試驗共用

網絡的安排並引入天然氣。另一方面，氣體燃料安全辦事處宜盡快研究天然氣在運輸和儲存方面的安全準則，俾經營者在設立儲存和輸送系統的時候得以參考，隨之把氣體供應網絡轉為接駁天然氣，令建議能早日付諸實行。估計使用天然氣應可節省超過一千一百萬元。

建議三

為保障消費利益，政府宜在共同輸送系統完全投入運作之前，把香港煤氣公司納入公用事業的監管計劃，採用對消費者和煤氣公司雙方均公平合理的監管模式：

- 1) 監管模式應足以促進經營效率並鼓勵投資和引進新服務方面的效益。
- 2) 監管的模式須避免令納稅人或受監管的公司負擔過重的行政支出。
- 3) 監管細則應包括一些「公眾利益」的條款，如節省能源。

消委會建議政府考慮「厘訂價格上限」的監管模式，使經營效率的得益全部歸於煤氣公司，同時保障消費者，免致負擔過高的收費。消委會又建議政府在煤氣公司開放供應網絡後，即取銷「價格上限」的監管，以鼓勵煤氣公司早日開放網絡。

估計煤氣公司一九九四年因壟斷優勢的得益為八千萬，因此，政府需要把煤氣公司納入監管的範圍內，確保政府對公用事業經營者監察政策的一致性，況且，其他能源供應的公用事業，如中電和香港電燈公司也受「管制計劃」的監察。

為貫徹公平競爭，消委會認為開放市場，讓新入行者參與競爭是最有效的方法，防止市場壟斷帶來不良影響。因此，消委會建議任何監管措施應屬短期性質，長遠目標是開放輸送網絡和採用天然氣。消委會希望政府提供積極指導和參與鼓勵建議的實施，若不然，相信難以推動煤氣公司開放共同輸送系統，引入競爭。

建議四

政府宜考慮以行政指令或立例方式，要求地產發展商在新建樓宇內提供足夠的設備，讓消費者自由選擇能源供應。即是，同時在單位內提供氣體燃料供應管道和三相電線，以配合即熱式電熱水爐所需的電壓負荷。估計為每樓宇單位裝置三相電線系統增加成本約為三千元，低於樓宇每平方呎的平均售價。雖然增加了支出，但為消費者換取自由選擇的機會，實在是值得的。

建議五

消委會建議政府設立能源管理局，以監管整個能源供應行業及制定能源政策。委員會可邀請公眾參與，並增加透明度，在運作上會更加完善。其職權涵蓋與能源政策有關的廣泛課題，包括能源和設備的供應、安全問題、價格及經營手法等。主要的功能在平衡各方的利益，包括煤氣公司、中電、港燈、石油氣供應

商和消費者等各方面。能源管理局的職務顯然較現存的氣體安全事務處為廣闊，政府可以擴大經濟科轄下的財務監察組的運作範圍。再者，能源管理局的成立，使受監管的行業和公眾方面對監管機構有鮮明的印象。

設立能源管理局統籌能源政策，及監管不同的能源供應者，較就不同的行業或公司而設立專責監管機構，更有效率和善用資源，對消費者及受監管公司更為有利。一旦政府決定實施共同輸送系統的建議，跨能源供應形式的能源管理局更能發揮協調的作用，並肩負審查和評核的責任。由於電力公司早已受政府監管，由同一管理局同時監察煤氣公司，更是順理成章。

從消費者角度，當然支持成立一個能源管理局的建議，管理局監察所有能源供應商，自然可以確保消費者自由選擇的權利，使樓房有足夠的配備，令消費者可以隨時選擇煤氣或電熱水爐。

消委會又建議同時成立能源諮詢委員會，成員包括政府人員、業界專門人士以及消費者代表。諮詢委員會的任務是向能源委員會提供有關能源政策的意見，類似氣體安全諮詢委員會的職能，但職責範圍較為廣闊。通過公眾的參與，委員會的工作得以提高透明度和取得客觀的意見，符合政府一貫的政策。

能源管理局的資源可從氣體供應事務處和經濟科結集，所需的營運費用不大，這安排亦會節省公帑開支。

其他建議

分類價格管制

收費方面，可以根據不同服務的性質，如煤氣費和維修費用，容許有不同的上限或管制方式(例如規定價格調整不應超過消費物價指數升幅)。總的來說，使各項目的收費及整體價格水平均須受到監察。

會計賬目的透明度和分立會計賬目

為有效監管價格和收費，銷售煤氣的收費和非煤氣銷售服務的收費應該分立賬目，如香港電訊為本地和國際電話服務的收費，分別有不同的賬目。且賬目須具有一定的透明度。這做法亦可為日後開放輸送系統、共同輸送網絡鋪路。

集中管道

現時若干先進國家新的建設把水、電及氣體的喉道，集中放在同一輸送管內，以方便檢查和維修，香港亦宜效法。

